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Educational News and Editorial Comment

SELECTING A SUPERINTENDENT

The city of Philadelphia is engaged through its Board of Education in the difficult task of finding a superintendent of schools. A special committee is canvassing the possibilities and has adopted, as one of its modes of procedure, correspondence with various educators as to the comparative merits of a number of possible candidates. As a basis for this correspondence the committee has drafted a statement of the qualifications which in the judgment of its members should be found in the man who is to be selected. The statement is as follows:

PERSONAL:

A dominating personality—a leader of men.

A man of good moral character and religious belief.

A good public speaker.

A man of strong constitution and good health, industrious, persevering, courageous, and with a high sense of personal honor; with a good sense of humor, clean in person and in mind; temperate in act and speech, knowing when to speak and when to keep silent; honest and square, tactful and diplomatic.

A man of forty to fifty years of age.

A man who is animated by ideals of service and who is kindly and sympathetic toward his assistants.

A man who, when the needs of the schools demand it, knows how to fight, and to fight hard.

PROFESSIONAL:

A graduate of a reputable college.

A graduate student of school administration or a professor of administration in one of the leading graduate schools of education.

An important contributor to publications of scientific societies or to educational periodicals upon contemporary problems of consequence to the administration of city schools.

A man who is recognized among superintendents of city schools as one of the ablest and most successful of their group.

EXPERIENCE:

A man who in his earlier years was a teacher and principal of an elementary school, who later became a superintendent in a small city which employed only the one executive officer, and who now holds, or has within the past two years held, the superintendency of a city school system in which there is one or more other departmental heads such as the business manager, superintendent of buildings, etc., and in which there is a wide variety of schools represented such as vocational schools, special classes for gifted and subnormal children, etc.

A man who is fully up-to-date in matters pertaining to supervision of instruction.

A man who has had uniformly conspicuous success in each of these classes of positions, and especially in those cities where conditions made success difficult to attain.

It is most encouraging to find a group of laymen laying stress, as is done in this statement, on professional qualifications of the highest type. There was a time when boards of education would have ignored the professional training of candidates or would at least have thought of it as a matter of very minor importance. Even now there are some patrons of schools and some school officers who hold to the older type of estimate of professional and scientific equipment. It is gratifying to those who think of the school superintendency as something more than a political job to come on evidence that there is a steady upward trend in the kind of demand that municipalities are making of school superintendents.

It is also very encouraging to note that boards of education are beginning systematically to canvass the whole country when an important school position is to be filled. Philadelphia is following the example of a number of the larger cities which in

recent years have given the fullest and most careful consideration to candidates from outside their own systems. Here again the narrow traditions of the past are not entirely overcome, but they are fast giving way to the progressive demands of modern civilization. To find the best man and the most competent man, wherever he is, and to select him for his professional equipment is coming to be expected whenever there is a school vacancy to be filled.

A NATIONAL SURVEY

The American City Bureau is an agency which helps chambers of commerce to extend their organizations and influence. This bureau goes into a city and secures members for the chamber of commerce and stimulates the members to take up the study of municipal problems and to undertake measures for the promotion of city welfare.

Professor Strayer has taken advantage of this agency and has secured its co-operation in a national survey of teachers, the purpose of which is to make it possible for any citizen to make comparisons between conditions as they exist in a given city and conditions throughout the country. A conference of superintendents was called in Cleveland last February, and an educational committee was organized within the City Bureau to collect school information. The inquiry was financed by the Commonwealth Fund and chambers of commerce have co-operated in reporting the facts which are now embodied in a report.

An advance statement by the City Bureau regarding a part of this report is given as follows in the *New York Evening Post:*

Chambers of commerce in 359 cities of the United States with a population of 8,000 or more will receive today from their national committee for co-operation with the public schools the results of a nation-wide survey relating to salaries, training, and experience of teachers in which it is declared that in point of salary the average school teacher is "worse off than before the war."

The report, the first of four "interpretive inquiries," will enable these cities, it is said, to learn for the first time the truth about their own schools and to compare them with the schools of other cities throughout the country.

This survey, which was undertaken by the American City Bureau after a conference of superintendents of schools with chamber of commerce secretaries at Cleveland, O., last February 24, has been in progress more than six months. The questions to which answers were sought and obtained in the

359 cities were: "How much training do your teachers have?" and "How well do you pay your school employees?"

One-half of the men elementary teachers in all cities reporting, it was shown, have had less than the median of 8.10 years of experience. One-fourth have had less than 3.71 years' experience. Of 68,291 teachers 3,493 have had only one year's experience, and of this number 758 are men and women high-school teachers and 2,735 are men and women elementary-grade teachers. More than 10,000 women and 300 men in the cities surveyed, however, have been teaching twenty years and over.

Emergency teachers lacking proper training for their work are said to compose "an alarmingly large proportion" of those now in the classrooms. It is a commonly accepted standard among city boards of education, the report points out, that the teachers in the elementary schools should be at least graduates of standard normal schools, which means a two-year professional course above graduation from a four-year high school.

"It is very significant to note in this connection," the report says, "that more than one-third of the teachers of American cities have less training than this low standard, and that there are thousands of teachers in the elementary schools of our American cities who have even less preparation than graduation from a four-year high-school course."

Following the section of the report described in this quotation there is a statement regarding teachers' salaries and a discussion of the importance of providing more adequate financial resources for the schools if the work of education is to go on at a high level.

RECOGNIZING INDIVIDUAL DIFFERENCES

The following description of a plan for conducting pupils through the elementary schools at varying rates, according to their different abilities, is quoted from the news letter of the University of Virginia:

Beginning with the session of 1919–20, Superintendent J. P. Neff introduced a modification of the Cambridge Plan of grading into the school system of Staunton, Va. The seven elementary grades were divided into three parallel sections, known as sections A, B, and C, respectively. In section A the course of study is divided into six years of work, and the grades are designated by the numbers from 1 to 6, each followed by the letter A. In section B the course is divided into seven years of work, the numbers from 1 to 7, followed by the letter B, being used to designate the grades. In section C the course covers eight years and the grades are numbered from 1C to 8C. All three sections complete the same course of study and prepare pupils for entrance into high school; they differ from each other only in the amount of work covered each

session. Under this "triple track" arrangement of grades, capable pupils may finish the elementary school in six years, those of average ability may finish in seven years and slow pupils may progress through the grades in eight years. Thus a child may enter the school system at 6 or 7 years of age and complete the elementary course when 12, 13, 14 or 15 years old, without skipping or repeating a grade.

This plan of grading is well adapted to any school system where the number of pupils is large enough to require three teachers for each of the lower grades. Its advantages are numerous. Bright children are given an amount of work commensurate with their ability; they are less likely to fall into habits of idleness and mediocrity through having too little to do; and they are enabled to reduce the number of years required for their education. Slow children are not required to attempt to keep pace with those of greater native ability; they are given a chance to replace the habit of failure with that of success because the amount of work expected of them is within the limit of their powers; and they are less likely to have their enthusiasm lessened by failure and consequent repetition of work.

Children of average ability continue to complete the work of the elementary school in seven years, as under the former system of grading. The work of all teachers is made easier and more effective because of the greater homogeneity of their classes. Discipline is less troublesome because of the lack of idleness due to the better adjustment of work. Instruction is simplified because it is relieved from the burden of having to adapt itself to widely divergent degrees of ability in the same classroom.

It has been known for a number of years that probably one-fourth of the pupils of an average school grade are capable of doing the work of the grade above, and that probably one-fourth should be in the grade below. The percentage of failures has emphasized those in the latter group. But the lack of flexibility in our system of grading has prevented adequate recognition of those in the former. Within any large grade or age group of individuals, there are as many above the average as below, and the amount of divergence of individuals above the average is as great as it is below.

Just as there is probably one feebleminded child in each hundred, selected at random, so there is also one child whose intelligence is as far above the average as that of the feebleminded child is below. We have taken account of the backward and the dull in our provision of special classes for them, but we have not provided for the unusually gifted, whose social worth is immeasurably greater. The plan of grading adopted in Staunton does not attempt to meet the needs of the upper or the lower five per cent—the highly gifted or the unusually dull. But it does attempt to take into account such differences in ability among children as will enable some of them to complete in six years a course of study which others cannot complete in less than eight.

The obvious difficulty in administering this plan of grading is in the assignment of pupils to the various sections. The basis of assignment used was

mainly the school records of the pupils. Those with the best records were put into section A; those whose records were poor were put into section C; pupils with average records were assigned to section B. Children entering school for the first time were interviewed, certain uniform questions were asked them as to their relatives, the location of their homes, and their ability to perform simple arithmetical operations, and the assignment was made on the basis of the general impression gained. A summer school was conducted for pupils who needed to do extra work to enter a given class. And it was provided that a pupil obviously misplaced might be shifted from one section to another. This, however, would involve, particularly in the upper grades, a temporary lack of adjustment, since no two grades or sections cover the same subject-matter at the same time.

NEW YORK CITY SCHOOL BUDGET

The public press has carried from time to time brief statements about the school budget of New York. The figures are large and the complications difficult to unravel for one who is far from the seat of action. The illuminating statement issued by the Public Education Association has more than local interest. It is as follows:

OUR ANNUAL SPECTACLE

We have with us again the annual budgetary "follies," with the mayor and the comptroller in their usual rôles. The spectacle this year, however, is more thrilling than ever before.

The program includes, in addition to several of the features of last year's bill, a special exhibition of fiscal acrobatics which for sheer nerve and assurance excels anything yet witnessed in this metropolis.

There is, of course, the well-known sleight-of-hand act of putting the school building item into the tax levy budget and taking it out again for political effect. And the efforts to save the people from the insidious designs of the villainous school authorities are performed with customary gusto. But the real thrill comes in what appears to be a war dance scene, where, after much side stepping and a series of marvelous "flip-flops," the educational budget like a huge dragon is cut right in two in the middle!

This is what happens:

Under the direction of the city authorities the Board of Education has prepared an annual budget estimate aggregating $146,322,050.11, which comprises $91,904,114.93 for current maintenance and operation, $7,497,607.38 for the redemption of special revenue bonds and tax notes authorized and requested to meet unforeseen additional expenses for 1920, and $46,920,327.80 for capital outlay for new sites and buildings.

After the public has been sufficiently flabbergasted by this enormous sum, it is suddenly more or less naively "discovered," as was also done last year,

that the latter item for sites and buildings should never have been included in the tax-levy budget at all, but should have been placed in a separate request for corporate stock! This simple device first serves to swell the total request of the Department of Education in the tax-levy budget and, then, after the desired effect has been produced on the public, offers a splendid opportunity for dramatic denunciation of the school budget and for heroic city officials to "serve the people" by removing this sum unceremoniously.

The scene is then shifted and action is concentrated on the item of $91,904,114.93 for current maintenance and operation. Of this amount the state contributes $9,877,652.16, leaving $82,026,462.77 for the city to appropriate. This is the real educational budget estimate for 1921.

Immediately the action becomes violent!

It is pointed out vociferously that this request is in excess of this year's allowance to the extent of $23,534,292.08, and that this is due primarily to the mandatory increase in teachers' salaries, caused by the nefarious Lockwood-Donohue Bill, which was passed over the dead bodies of the mayor and the comptroller.

Think of it! Over $62,000,000 for the salaries of the professional staff in the budget for 1921, as compared with less than $40,000,000 in the original allowance for 1920! And all due to mandatory legislation passed, it is true, under the pressure of overwhelming public opinion, but without the approval of the mayor and the comptroller! Surely something must be done to correct and combat such an inexcusable blunder and injustice in a more or less perfect democracy!

It is here again that art, or rather artifice, is employed to triumph over the city's foes.

Since the state, through its Legislature, wilfully placed this "burden" on the city of New York, why shouldn't the state through its own tax levy obtain the necessary funds? This would not only be treating the state in the way it always deserves but also enable the city fathers to use local funds for other purposes and thereby escape the political backfire of an unpopular high tax rate.

Accordingly, the old mandatory provision of 4.9 mills of the tax-rate for school purposes is trotted out to the footlights, despite the fact that it has been made obsolete by the more recent and equally mandatory Lockwood-Donohue Bill, inasmuch as it does not furnish enough to pay even the salaries of teachers. It is thereupon brazenly proposed that the city grant the schools next year only the product derived from this rate, amounting to some $43,720,880.83, and that it be put up to the Legislature to provide the remaining $38,305,581.94 necessary to meet the total request of $82,026,462.77.

What a thrilling suggestion and how pregnant with possibilities for the city school system!

It would really make no difference to the people, of course, since they would pay the taxes anyway, whether levied by the city or the state. But the city

tax-rate would look much lower, the people would think they were getting something for nothing, and the local politicians would live happily forever after!

Nevertheless there is an element of good in all things apparently evil, for, while at first glance this grotesque proposition would seem to threaten the integrity of the schools and leave their operation after July 1 next to the mercy of the Legislature, it may well be that the city authorities have unwittingly performed a signal service to the cause of public education. Thoughtful students of public school administration have long stood for education as a state function and have sought in many ways to concentrate ultimate control of the system in the state department of education. In this they have always been combatted by the city authorities. It is therefore a source of great satisfaction to have our own city officials, however unwittingly, offer such a proposition on their own initiative. For if the state is to be requested to relieve the city to such an extent financially, it is inconceivable that it should not be expected also to relieve the city equally of control and direction of the school system. The city authorities could, therefore, have suggested nothing more welcome than that the present financial death grip of the municipal government on the school system be broken. It may well be interpreted as an important step forward toward the financial independence of the city board of education as the local subdivision of the state department of education.

There is every reason to believe, however, that the city authorities will not pursue this course to its logical conclusion. The "show" is not yet over.

We have yet to see the ensemble before the curtain falls on the last day of this month. The "follies" will doubtless pursue their joysome way to the very end, and we can reasonably expect to see an early change of scene. A loop-hole has already been artfully suggested in the veiled promise to give the schools a "second helping" after all the other city departments have been taken care of. We shall not be surprised, therefore, to see the schools get substantially their total requests in the final appropriations.

SUBSIDIES FOR TEACHERS IN TRAINING

From a number of sources one hears the suggestion that states should subsidize students in normal schools as the most effective means of recruiting the teaching profession. The proposal in the concrete, as it is to be presented, for example, at the November meeting of the Missouri State Teachers' Association, is that the state pay to each normal student $100, taking in return a note of indebtedness from the student. If the student teaches in a public school in Missouri sixteen months within a period of six years, the note is to be canceled; if the obligation to teach is not fulfilled, the note is to be collected. Similar plans are being advocated or at least discussed in other states.

A part of the argument for some such plan can be very forcibly stated in terms of the obligations of the state to its own institutions, the normal schools. It is literally true in most states that the normal school, after being set up and equipped at large expense, is given no support in its canvass for students. A well-organized state normal school finds itself in competition with all kinds of private and public institutions which attract students. The fact that the state needs teachers and is prepared to train them does not bring students and, especially in recent years, the normal schools find themselves suffering seriously in the competition.

It is the belief of the present writer that the situation needs attention, but that the plan of a subsidy for young people who are in training is not the right solution of the problem. Let us suppose for a moment that the plan of a subsidy is adopted. Its immediate effect would undoubtedly be to increase very greatly the number of people preparing to teach. In a very short time there would be coming from the normal schools a stream of people obligated to teach in the schools of the state for two years. Communities would feel that these people had been already very well treated and would hold to a salary scale reduced to make up for the subsidy, which they would be likely to magnify, as a substantial payment in advance.

The better plan is to get a law passed in every state forbidding communities to employ any person to teach school who does not have a normal-school training. This law would operate to fill the normal schools and would also operate to increase salaries. It would leave the individual to meet his own expenses while he is a student, but it would assure him reasonable compensation for expert services if he is successful in completing his training.

There is strong support for the argument here presented in the experience of European nations. England has long been slack in requirements for appointment to teaching positions, but has been generous in subsidies to persons preparing to enter the profession. England has long suffered from an undersupply of trained teachers and has at times been, like ourselves, unable to get teachers for many of the schools of the less-favored districts. Germany, on the other hand, has not subsidized students, but has made the

position of teacher attractive, with the result that there were more candidates than places to be filled up to the beginning of the war.

One might cite also the experience of American schools of theology as by no means encouraging for the subsidy plan. Our divinity students are given scholarships and other exemptions in lavish amounts. One divinity school is reported to have more funds for student scholarships than for professors' salaries. Has the result been a large recruiting of the clergy?

MUSEUMS

The Department of Education of the city of New York has published a pamphlet entitled *Free Nature Education by the American Museum of Natural History*. This pamphlet gives an account of the ways in which the museum has provided material for the schools throughout New York City and has also prepared instructive material which can be examined by anyone who visits the museum. The text also emphasizes the very great importance of presenting to people, as incidental materials of instruction, the results of scientific investigations of natural phenomena. A great many people are interested in natural facts, if these can be presented in intelligible form and in a form which can be readily assimilated by one who has only meager educational advantages.

European cities have long recognized the importance of museums and have utilized them as devices for public education. There is not an industrial city in Europe which is not supplied with an industrial museum, giving to the common people an opportunity to become acquainted, through direct observation, with the mechanical devices that are employed in all sorts of manufacturing and transportation processes. In like fashion, museums of natural history and museums of fine art are regarded as necessary equipments of any municipality.

This country has been very slow to see the practical importance of education of this kind. The schools also have only recently recognized the fact that equipment other than textbooks is necessary if children are to be made acquainted with the world about them.

This pamphlet on *Free Nature Education* makes a very emphatic case for general education through museum material, both in the schools and for the common people. It can be read with advantage by citizens and school officers in all parts of the United States. To be sure, many communities do not have the advantages of a collection of materials which can be readily used for these purposes, and no city other than New York is supplied with the rich collection to be found in the American Museum, but the spirit that controls the activities of the American Museum can express itself in a similar way in any municipality which sees the importance of this type of training for its people.

A CORRECTION

Mr. F. Dean McClusky, author of articles in the September and October issues of the *Elementary School Journal*, asks that the following statement be published:

Mr. I. L. Kandel, to whom reference was made on page 34 of the September issue of the *Elementary School Journal*, objects to the statement which is incorrectly made in my article that he "repeats Monroe's statements." Mr. Kandel writes to me as follows:

"I have just read the first instalment of your article in the *Elementary School Journal* for September. I only wish here to ask whether a statement that an article written in May repeats articles written in June and September is an example of the non-traditional type of cultivating history."

Mr. Kandel is quite right in recording objection to being put second in this matter, and I hope you will be willing to see that my mistake is corrected.

News Items from the School of Education of the University of Chicago

DETAILED STUDIES OF ELEMENTARY-SCHOOL SUBJECTS

There has been an insistent demand during recent years for intensive studies of elementary-school subjects, the results of which can be used in improving instruction. It is significant that candidates for higher degrees are making such problems the basis of their investigations. Two such studies which were recently completed in the Graduate Department of the School of Education are reported briefly in the paragraphs which follow.

The first investigation, entitled "An Experimental Study of the Reading of Isolated Numerals and of Numerals in Arithmetic Problems," was carried on by Paul W. Terry, Ph.D. The purpose of this investigation was to describe the methods used by adults in reading isolated numerals and numerals in arithmetical problems. In the first part of the work introspective observations on the part of the subjects provided the data, and in the second part the data were procured by photographing the movements of the eyes of the subjects as they read problems.

Two phases of the reading of a problem are distinguished, namely, the first reading and the re-reading. During the first reading the conditions of the problem are learned and the numerals, which are always noticed in some fashion, are read either partially or wholly. Whole first reading implies complete and accurate perception of a numeral, and any reading less than this is called a partial first reading. This latter method of first reading is more economical of time and it was used by the faster readers.

During the re-reading the numerals only were found to be the objects of attention. Re-reading is closely connected with copying the numerals on the computation paper. Certain individuals did not re-read the numerals but computed directly from the problem as it appeared. Large possibilities of economy in respect to time and mental energy are found in this method of procedure.

The isolated numerals were found to be read by grouping the digits in certain ways depending mainly on the lengths of the numerals. The effect of punctuation as facilitating the use of larger groups of digits is described. As the numerals increased in length more time and more phases of the eye were required to read them. The subjects revealed two methods of attack in reading the numerals. In the one case a small number of long pauses were involved, and in the other case a large number of short pauses.

A large number of plates give detailed pictures of the readings of individuals, both in the case of the isolated numerals and in the case of the problems. Every section of the report contains information and suggestions of genuine value to teachers of arithmetic. Dr. Terry's report will be published as one of the Supplementary Educational Monographs.

The second investigation, entitled "The Content of School Courses in English Grammar," was made by Martin James Stormzand, Ph.D. The purpose of the investigation was to determine what the content of school courses in English grammar should be when based on the relative frequencies of the various grammatical usages.

In order to secure information 10,000 sentences were analyzed, approximating 200,000 running words. These sentences were selected from material ranging from the best type of standard prose to the most ephemeral matter of the daily newspaper and popular fiction. Written material was also included which had been written by students in the sixth grade or above.

The results include a complete evaluation of all available topics in courses in English grammar on the basis of their relative frequency in daily use. Such a body of facts is of very large importance in determining the amount of emphasis which should be given in instruction to various topics. Dr. Stormzand points out clearly that a valid grammar curriculum can be organized only when both the frequency of usage and the frequency of errors are considered. Significant criticisms of current courses in grammar are pointed out. The investigation has paved the way for the intensive study of a number of problems relating to the psychology of language acquisition.

PROBLEM-SOLVING OR PRACTICE IN THINKING. III[1]

SAMUEL CHESTER PARKER
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Synopsis of preceding articles.—The preceding discussion consisted of two parts, (I) An account of the place of problem-solving in everyday life, and (II) two sample lessons from the University of Chicago Elementary School. These depicted (*a*) pupils in the seventh grade debating the possibility and desirability of increasing America's sugar production, and (*b*) kindergarten pupils engaged in designing and constructing cardboard grocery stores. The present article will continue the sample lessons constituting section II of the discussion and then introduce section III on "how great problem-solvers think."

C. SECOND GRADE: HOW TO DRESS AN ARAB DOLL

Relation to course in community life.—The study of the pupils' immediate environment which we found illustrated in the kindergarten lesson on grocery stores is followed in the first grade by a study of *farm* life and *Indian* life. These social types enrich the pupils' ideas of human wants and needs and of means of meeting these. In the second grade another strategic type of civilization is encountered in the study of primitive *shepherd* life.[2] Here the Arabs of the desert were being studied when the lesson which we shall describe was observed. The lesson occurred after the class had been studying Arabs for some time. On the sand table the children had made a desert, sand hills, and camel tracks, and had planted some miniature palm trees. On the blackboard along one side of the room were pictures of deserts, sand hills, and several camels. The teacher was Miss Mary Cameron.

Conversation reported to illustrate details of technique.—In describing this lesson we shall report more of the language used by the teacher and pupils in order to give a more detailed impression of the mental activities of the class, and of certain details of the

[1] This is the third of a series of four articles on this topic.

[2] For a full description of the study of shepherd life in this grade, see the *Elementary School Journal*, XVII (February, 1917), 411–16.

teacher's technique. Only a part of the total conversation of the pupils and teacher is reproduced, but enough is given to illustrate the conversational method of teaching. To assist the reader in following the conversation, the teacher's part is printed in italics.[1]

Problem for the day.—In the teacher's mind, the problem for the day was a study of the dress of the Arabs. The fundamental aim was to clarify and enlarge the ideas of the children concerning costumes. In the minds of the children, it was dressing dolls to people their desert.

Procedure: (1) *Children suggested several things that needed to be done.*—"*We have finished our oasis and desert. What shall we do today?*" asked Miss Cameron. The children replied, "Make some camels." "Make some Arabs." "*What Arabs would you like to make?*" "Some traveling Arabs." "We can make some tents, too," said one child. "*How many Arabs shall we make?*" "Twelve." "*But,*" said the teacher, "*our sand table is not very large.*" "Let's make two tents and two families," came from a little girl. "*How many do you want in your family?*" "The father, the mother, and a little boy or a little girl." "*All right,*" said Miss Cameron, "*or there might be both a little boy and a little girl. Now, here are the dolls you brought me. Which shall we choose for the father?*" One doll was chosen. "*What shall we do next?*" "Make his clothes?" "*Yes, but what must we do before we actually make the clothes? What does your mother do before she makes you a dress?*" "She cuts a pattern." "*Yes, and what else?*" "She measures me." "*Yes, and what else?*" It was then decided that the clothing must be planned before it could be made. The planning followed.

2. *Teacher focused attention on planning clothes for father doll.*—"*What clothes shall we need to make for the father?*" asked Miss Cameron. "A turban." "A robe." "A sash." "Weapons." Then someone else suggested sandals. "How can we make sandals?" came from a little girl. "*We will leave that for another time,*" replied the teacher. "*What else shall we need for the father?*"

[1] Again I am indebted to Miss Mildred Harris, who took shorthand notes, for a description of this lesson. I have inserted the paragraph headlines.

"A shawl." *"Why does an Arab wear a shawl?"* "It is so cold at night."

3. *Summary of suggestions by children.*—*"Who can tell me everything that we shall need to make for the father?"* A child volunteered, "A sash, a robe, a turban, sandals, and a shawl." *"Let's look at some pictures,"* said the teacher. *"Notice carefully what these Arabs have on. Think about how we can make the clothes for the father."* The children then all looked at the pictures.

4. *Attacked problem of making a robe.*—One little girl exclaimed, "We will *have* to have a robe." *"What will you need to make a robe?"* Then, from various children came "Scissors." "Thread." "Red cloth." "A ruler." "Needles." "White cloth." *"All right,"* said Miss Cameron, *"here is some cloth. Who has a suggestion for making the robe?"*

5. *Boy experimented on robe.*—A boy went up to the table and taking a small piece of white cloth, cut a hole in it, and slipped it over the head of the doll. The teacher asked him to hold it up so that the others might see it.

6. *Criticisms and alternative suggestions by other children.*—A couple of the children objected to the looks, saying, "It is too short." *"How long should it be?"* "It should come below the knees." "Oh, it should come clear to the heels," from another pupil. *"What else can you suggest about this robe?"* "Robes are loose over the shoulder." *"How could we make a robe that way?"* One boy said he would have a piece hang over each shoulder. Another wanted it to come to a point in the back. Another wanted it fastened in some way. One said the hole for the neck was too large. *"Why is it too large?"* asked Miss Cameron. "It won't stay on the shoulder." "You could button it on," said one girl. *"Who thinks he can make a better robe?"* A girl tried. She held the doll up and said, "I would hold it together, this way, with a sash." *"Is it all right?"* asked the teacher. "No, it is not full enough."

7. *Subordinate problems arose: sleeves and sash.*—"Where are the sleeves?" asked a child. *"Will someone show us how the sleeves might be fixed so that they will be right?"* added the teacher. A girl pinned the sleeves. *"Do you think that is better?"* "No,"

came from several. Finally, the children got the sleeves pinned a little more to their taste. *"What could we use for a girdle?"* queried Miss Cameron. "A piece of cloth." "A piece of tape." "Paper." *"I am thinking of something that your mothers are using a great deal these days,"* said she. "Yarn!" A piece of yarn was selected and wound around the doll. *"Do you like the side of this robe? Shall we tomorrow make the side this way?"* "No," said a child, "we must sew it." The teacher then had them examine a seam of a little child's dress. They decided the edge of the seam must be straight and not left rough. "We can tuck it in," said a child, meaning French-seamed.

8. *Devising a turban.*—*"What else can we make for the father?"* "A turban." *"All right."* A girl then took a piece of white cloth and tried to make a turban. She made it look about like a veil, hanging down the back. *"Do you think it looks like a turban?"* "No, it should not hang down," said a boy. *"You try it,"* said the teacher. The boy got up and tore a very narrow strip off and wound it around the head of the doll. The result was a pretty good turban. "Looks like the father had a sore head," said one child.

9. *Standard for comparison presented by teacher.*—*"Compare it with a picture of a turban,"* said the teacher, producing a picture of a man with a turban. "Pretty good," was the general verdict. But some were not satisfied with the sore-head appearance. *"See if you can improve upon it,"* to a little girl. The latter tried to make a turban by first winding it around her finger. She failed, and then wound the strip around the doll's head as the boy had done. However, she took a broader strip. Some liked it better. *"Why do you think it is better?"* "It covers the head better." "It is more the shape." *"Is the turban finished?"* "No, a cord should be around it." *"You come and put a cord on."* A boy put a bit of yarn around the turban for a cord. "It should be the same color as the sash," came from a girl. *"That might look better,"* said the teacher.

10. *Problem for next day.*—*"Tomorrow we shall make a shawl. If any of you have anything at home that you think you would like to use to make your shawl, it would be nice to bring it to school."* Then

different children told of what they could bring. "We must make a collar. Men wear collars," came from one child. "*Do Arabs wear collars?*" They decided not.

11. *Child off the track.*—One girl arose and very earnestly began telling how a doll she had was dressed. It was brought from abroad. It was a French doll. The teacher listened a moment and then asked, "*But what kind of people are we talking about?*" "Arabs" came in a chorus. "*Bring your things for a shawl tomorrow, and we shall finish dressing the Arab father.*" Thus ended the lesson.

Conversational method prevails in problem-solving discussions.—As indicated above, the conversational form in which this second-grade lesson is described helps us to get a clearer idea of the conversational spirit that prevails in a problem-solving discussion lesson than we derived from the seventh-grade lesson on sugar production or the kindergarten construction lesson. It is important to realize, however, that in both these lessons the same informal conversational give-and-take between teacher and pupils prevailed. At the same time, in all the lessons, we feel that the teacher is a very definite, stimulating, and guiding force. She keeps the pupils' minds actively directed along educative lines so that they are acquiring important ideas at the same time that they are acquiring training in the reflective solution of problems.

D. Fifth Grade: Standardized Short Geography Problems on the British Isles

Transition from simple primary construction problems to technical scientific problems of higher grades.—As a final example of problem-solving lessons in the elementary school, we shall present one from a fifth-grade class in geography. This lesson will show the transition from (*a*) the simple construction problems arising out of social needs which we have illustrated from the kindergarten and second grade to (*b*) the more complicated, technical problems of the upper grades which we illustrated by the problem of the United States increasing its sugar production, and which brought in such technical issues as the number of growing days required by sugar cane, the cost of labor, competing crops, and the question of a tariff on sugar. In this fifth-grade lesson we shall find the children dealing with certain simple technical matters such as the tides in navigable

rivers and the use of a scale of miles and of the directions, east, west, north, and south, in reading a map.

London problems. How is London influenced by the Thames? Dialogue.—Under the direction of Miss Edith Parker, the children in the fifth grade had taken up the study of the British Isles. They had begun the study of London shortly before the lesson which we shall describe. In order to give the reader further notions of the conversational technique of problem-solving discussion lessons, we shall present most of this lesson in dialogue form as reconstructed from rapid memoranda which I made during my observation. We shall use capital "T" to designate the teacher's remarks, which are printed in italics, and capital "P" to designate the pupils' remarks. Occasionally, where I caught the name of the pupil, I have used it. Much of the dialogue is omitted, but enough is given to illustrate the procedure. The teacher's remarks are numbered in order to facilitate discussions of the lesson.

The lesson.—After the children were seated and quiet reigned, the lesson proceeded as follows:

Introductory.—(1) T: *"How many can now see London on the map without looking at the latter?"* (The pupils held up their hands as Miss Parker waited a moment.) *"About how far from the mouth of the river is it? Look at your maps and, using your scale of miles, work it out."*

P: "I say it is exactly forty miles, because it is double the distance across the Strait."

Another P: "I say it is just thirty-five by the scale."

(2) T: *"Your differences may be due to your choosing different places as marking the mouth of the river. Measure clear out to the place marked North Foreland."* (The children then discussed and decided upon the distance.)

(3) T: *"How could such a large seaport as London develop so far up the Thames River? Put up your hands when you are ready. I want to see many of you ready before I call on anybody."* (She then waited about one-half minute.) Martha: "Because of the tides."

(4) T: *"How do the tides help?"* Martha: "I don't know how." Julian: "The tides help to make it a great port. They let the boats come in."

(5) T: "*How many agree with Julian?*" . . . . (A brief discussion followed which brought out the fact that the *high* tides make the river deep enough to let the *big* boats come up. The teacher told of *large* vessels waiting at Gravesend for *high* tide to ascend the river and of "locked" docks being used to keep these vessels afloat during *low* tide.)

Written questions presented.—T: "*We have here* (indicating the blackboard) *some questions for you. Some you can answer easily and others you will have to think out. Will you read the first question and answer it, Ellwood?*" (The full list of questions is printed in the footnote below.[1])

First written question.—Ellwood read, "How is the city situated with regard to the Thames? See map on page —." (The pupils turned to a small map of London. Ellwood's answer was vague.)

Another P: "The map shows the river running right through London. They have a Hyde Park!" (These children lived in Hyde Park of Chicago.) Another P: "The river looks awfully twisty here—not straight."

(6) T: "*What other points about London and the Thames do you find from this map?*" Various P: "Many parks." "Victory roads." (Other irrelevant answers.)

(7) T: "*Do those have anything to do with the Thames? It is not a good answer unless it shows how London is related to the Thames.*" (The pupils now held better to the question.) P: "It has many bridges." Another P: "The city extends far along the river, both north and south of it."

[1] The questions for Miss Parker's lesson on London were written on the blackboard as follows:

LONDON

1. How is the city situated with regard to the Thames? See map on page —.
2. What determined the location of London Bridge?
3. In which direction are the docks from the bridge and why?
4. How does the location of the docks affect the location of the factories in London?
5. How does the location of the factories affect the location of the living quarters for workers?
6. Where would you expect the business section to be?
7. Where would you expect the wealthy residence section to be?
8. Why has London become such a great city?

(8) T: "*How long is London?*" P: "About eighteen miles." (Various other answers to the first question were developed.)

Summing up first question.—(9) T: "*Now let us sum up what we have found in answer to the first question.*" (As the pupils enumerated their points, the teacher wrote them on the board in outline form, thus:

1. On both sides
2. Winding
3. 20 miles
4. Bridges

Second question.—P (reads from blackboard): "What determined the location of London Bridge?"

(10) T: "*If you had visited the Thames River and the site of London before the city was built, you would have seen something like this.*" (Then she drew on the board a diagram of the river and described the location of the highlands and the low marshes and swamps.) "*When the people wanted to build a bridge over the Thames, where would you say it would be, judging from this diagram?*" (The children were very quiet and considerably puzzled.) P: "Right here where it was narrowest." (Pointing at a certain point on the diagram.)

(11) T: "*My diagram is not exactly right if the river seems narrower to you at this point. I will change it because the river is not really narrower there. What do you think, Frank?*" Frank: "I should say right here, near the highland; one could easily get at it." (The pupils now became quite active in agreeing or disagreeing with Frank.)

P: "I agree with Frank, but I want to ask a question first. (He then went to the board and asked something about the depth of the river. He quickly decided his own idea was not a good one and retired to his seat. After the hour, Miss Parker said this boy was an impulsive thinker, and that his self-checking in this case really represented growth on his part. As a rule the class or teacher had to check him.)

(12) T: "*Now let's finish the discussion of Frank's plan before we take up another.*" (Several pupils talked, largely in terms of carrying timbers, easy access to one bank or the other, etc.)

(13) T: "*How many are pretty well convinced now that this would be the best place for the bridge?*" (Many hands were held up.) "*Do you have something new to offer, Oliver?*" Oliver started to talk along the same line.

(14) T: "*Yours is just a part of the same general argument. . . . Are you ready to know what really happened? . . . . This is the place* (pointing at the diagram) *that the bridge was built. Here the river swings in against the cliff. It was the first place as they came up the river, where they could find a good place to build a bridge. . . . .*" (She then sketched in the bridge on the diagram.)

Third question.—(15) T: "*Our next question, Jack.*" Jack read: "In which direction are the docks from the bridge, and why?" P: "That's the easiest question yet. Seaward."

(16) T: "*Yes, that's a good answer, but I mean what cardinal direction, north, east, south, or west.*" Various P: "North." "West." "East."

(17) T: "*Isn't it strange that you can't tell me from this small map whether the docks are east, west, north, or south of the bridge. . . . What is the difficulty?*"[1] (The period was now at an end, so this problem, together with questions 4, 5, 6, and 7, which dealt with the location of factories and residence sections and the reasons for the greatness of London, were left for the next lesson.)

Growth of diagram summarizes results of thinking.—At the end of the discussion of all the questions, the simple diagram of the bends in the river with which they began had been supplemented with answers from the later questions until it showed the docks for various kinds of merchandise, factories of various kinds, residence districts for poor and rich, etc.

Points of technique briefly noted.—As in the case of the first two lessons which we described, it will be helpful to note certain general characteristics of this London lesson preliminary to our organized discussion of technique which is to follow in section IV. Briefly stated these characteristics are the following:

1. *A deliberate pace prevailed.* For example, in the paragraph numbered 3 in the dialogue, Miss Parker waited about one-half

[1] Miss Parker explained to me later that while the children had attained fair skill in reading directions on large colored maps, they needed more drill in applying the same principles to small city maps.

minute after saying, "Put up your hands when you are ready. I want to see many of you ready before I call on anybody."

2. *Evaluation by the pupils was encouraged.*—Among Miss Parker's favorite remarks are, "Do you think that is a good point?" "Do you agree with that?" "Is that a good argument?"

3. *Standards of good thinking were taught the pupils.*—Examples occur in paragraph 7, where she emphasized holding to the question by saying, "It is not a good answer unless it shows how London is related to the Thames," and in paragraph 12, "Now let's finish the discussion of Frank's plan before we take up another," and in paragraph 14, "Yours is just a part of the same general argument."

4. *Summing up the discussion was periodically attended to.*—The best example given above is in paragraph 9, where the answers to the first problem were reviewed by a pupil and written on the board by the teacher as a few concise numbered points.

5. *The thinking was kept organized* by four devices, namely (*a*) writing the principal questions on the board; (*b*) holding to the main point of each discussion as described above under 3; (*c*) summing up periodically, as described under 4; and (*d*) by building upon a diagram the important data, suggestions, and conclusions as they came along.

Experimentation in grading problems and technical data and activities for fifth-grade geography.—Finally, before turning to section III of the discussion, in which we shall inquire how skilled problem-solvers think, we may, as a further preliminary to our general conclusions about technique in section IV, present Miss Parker's own memorandum concerning experimental work in organizing problem-solving lessons in the middle grades. These points she gave me for presentation to my class of teachers before we observed one of her fifth-grade lessons. She wrote as follows:

> Experimental work in teaching geography in this fifth grade is being done in order
>
> 1. To determine what problems are of the right difficulty for children of this age; in other words, to grade problems.
>
> 2. To determine the degree of subdivision of problems necessary and the definite steps in solution that need to be indicated for children of this age.
>
> 3. To grade the map reading, text reading, picture reading, and statistics reading that is motivated by these problems.

4. To devise means of establishing thoroughly those principles of interpretation of maps, pictures, statements, and statistics that can be established in this grade.

5. To devise means of helping children of this age to work independently and to check their own inferences. (Written directions are being used at present in an effort to lessen dependence on the teacher.)

6. To devise means of getting reactions at each step from *each* individual rather than from one or two. This is a vital matter in the fifth grade where basic interpretation habits are being formed. It is a matter that is often neglected where the problem-solving method is dominant.

Conclusion of discussion of actual lessons of section II. Transition to section III.—This will conclude our long section II, in which we have presented, in considerable detail, four problem-solving lessons in order to give the beginning teacher a vivid idea of this type of teaching as it is actually carried on in a progressive elementary school. The seventh-grade lesson on sugar and the kindergarten cardboard construction lesson gave us general notions of the organization of such lessons. The conversational data given in the second-grade Arab lesson and the dialogue of the fifth-grade London lesson brought us more intimately into the conversational give-and-take between teacher and pupils that characterizes problem-solving discussions. In all the lessons, we found the teacher aiding the pupils to get the problem clearly in mind, to make and evaluate suggestions, and to keep their thoughts moving actively along some particular educative line. We found many of the pupils alert and active in suggestion, sometimes keenly critical, and gradually developing in ability from the kindergarten, where they decided how many hinges a door needed, to the seventh grade, where they were ready to consider whether a tariff should be placed on sugar in order to encourage home production. In Miss Parker's final memorandum we found a skilled teacher especially concerned about the issue of grading problems in the middle grades so as to adapt them in general to this grade of pupils, and to give even the slow pupils practice in thoughtfully using the technical tools of problem-solving that are used by scientific specialists in geography. We shall now turn to a description of how problem-solving thinking is done by skilled thinkers, notably great scientists, such as great geographers, astronomers, etc.

III. HOW SKILFUL PROBLEM-SOLVERS THINK

Need to analyze skills to determine methods.—In discussions of the teaching of any form of skill such as handwriting or reading, we find it necessary to determine how skilful performers behave, e.g., how skilful handwriters and readers perform, in order to determine how to give pupils similar skill. In the case of handwriting, for example, we find that careful laboratory experiments have been necessary in order to prove that in much expert handwriting the letters are made predominantly with finger movements instead of arm movements. In the case of reading, we find that a variety of types of reading skill can be distinguished, and that many tests and laboratory experiments have helped us considerably in understanding how skilled reading is done and how to train children to be skilful, resourceful readers.

Need similar analysis of skill in problem-solving.—Similarly, in the case of problem-solving, we need a clear understanding of how skilful problem-solvers think in order to practice pupils in doing the same type of thinking. As in the case of handwriting and reading, so in the case of thinking, a number of erroneous ideas have prevailed concerning the nature of the processes of skilled performers. We shall not have time or space, however, to discuss these mistaken notions here, but shall turn our attention immediately to an account of the methods of thinking and inquiry used by some of the greatest thinkers, namely, by great scientists as these are described by W. Whewell in his *History of the Inductive Sciences*.[1]

Biographies of certain great scientists reveal methods of thinking.—Whewell had made a profound study of the methods and results of most of the great scientists up to his time. In connection with his account of the great astronomer, Kepler (1571–1630), he

[1] Whewell's work, published in 1837, is an excellent exhibition of careful English scholarship. T. H. Huxley, in *The Advance of Science*, p. 74, characterizes Whewell as a man of "great acquirements and remarkable intellectual powers." It would be well if more persons would secure their ideas of scientific method from such works as Whewell's instead of from Francis Bacon's false theories. In contrast with Bacon's ignorance of actual scientific investigations and ridicule of the methods of his great scientific contemporaries (such as Copernicus) Whewell proceeded to derive correct notions of the nature of scientific thinking by an examination of the methods actually used by great scientists in their work.

describes methods of scientific study and research in general, and, at the same time, gives an interesting account of Kepler's peculiar traits.

Accounts should include failures as well as successes. Whewell's description.—Kepler's investigations furnish especially good material from which to determine how a great scientist thinks because he left accounts of his whole process of inquiry, including his incorrect ideas and unsuccessful endeavors as well as the correct ones. With these accounts in mind, Whewell wrote the following discussion of how great scientists discover new truths and solve great scientific problems (I, 291–92):

> *Bold guessing.*—Advances in knowledge are not commonly made without the previous exercise of some *boldness and license in guessing.* The discovery of new truths requires, undoubtedly, minds careful and scrupulous in examining what is suggested, but it requires, no less, such as are quick and fertile in suggesting. What is invention except the talent of rapidly calling before us many possibilities and selecting the appropriate one? It is true that when we have rejected all the inadmissible suppositions, they are quickly forgotten by most persons, and few think it necessary to dwell on these discarded hypotheses, and on the process by which they were condemned, as Kepler has done.
>
> *Reasoning on many errors.*—But all who discover truths must have *reasoned upon many errors* to obtain each truth; every accepted doctrine must have been one selected out of many candidates. In making many conjectures which on trial proved erroneous, Kepler was no more fanciful or unphilosophical than other discoverers have been. *Discovery is not a cautious or rigorous process in the sense of abstaining from such suppositions.* But there are great differences, in different cases, in the facility with which guesses are proved to be errors and in the degree of attention with which the error and the proof are afterwards dwelt on. Kepler certainly was remarkable for the labor which he gave to such self-refutations and for the candor and copiousness with which he narrated them; his works are in this way extremely curious and amusing and are a very instructive exhibition of the mental process of discovery. But in this respect, I venture to believe, they exhibit to us the usual process (somewhat caricatured) of inventive minds—they rather exemplify the *rule* of genius than (as has generally been hitherto taught) the *exception.* We may add that if many of Kepler's guesses now appear fanciful and absurd, because time and observation have refuted them, others, which were at the time equally gratuitous, have been confirmed by succeeding discoveries in a manner which makes them appear marvelously sagacious, as, for instance, his assertion of the rotation of the sun on axis before the invention of the telescope. Nothing can be more just, as well as more poetically happy, than Kepler's picture of

the philosopher's pursuit of scientific truth, conveyed by means of an allusion to Vergil's shepherd and shepherdess.

> Coy yet inviting, Galatea loves
> To sport in sight, then plunge into the groves;
> The challenge given, she darts along the green,
> Will not be caught, yet would not run unseen.

Devising tests of false suppositions.—We may notice as another peculiarity of Kepler's reasonings the length and laboriousness of the processes by which he discovered the errors of his first guesses. One of the most important talents requisite for a discoverer is the *ingenuity and skill which devises means for rapidly testing false suppositions* as they offer themselves. This talent Kepler did not possess; he was not even a good arithmetical calculator, often making mistakes, some of which he detected and laments, while others escaped him to the last.

Willingness to abandon false hypothesis.—But his defects in this respect were compensated by his courage and perseverance in undertaking and executing such tasks; and, what was still more admirable, he never allowed the labor he had spent upon any conjecture to produce any reluctance in *abandoning the hypothesis as soon as he had evidence of its inaccuracy.* The only way in which he rewarded himself for his trouble was by describing to the world, in his lively manner, his schemes, exertions, and feelings.

Scientists' method of solving problems. Bold guessing; erroneous guessing; devising tests; abandoning errors.—Careful reading and study of the above quotation will give us most of the ideas that we need to understand the thinking processes in problem-solving. We may list them briefly as follows:

1. Bold guessing as the basis of fertile suggesting.

2. Erroneous guessing, "All who discover truths must have reasoned upon many errors to discover each truth."[1]

[1] Huxley (*op. cit.*, p. 33) supports Whewell's statement of the place of guessing or conjecturing in careful scientific thinking in the following words:

"It is a favorite popular delusion that the scientific inquirer is under a sort of moral obligation to abstain from going beyond that generalization of observed facts which is absurdly called Baconian induction. But anyone who is practically acquainted with scientific work is aware that those who refuse to go beyond fact, rarely get as far as fact; and anyone who has studied the history of science knows that almost every great step therein has been made by the "anticipation of nature," that is, by the invention of hypotheses, which, though verifiable, often had very little foundation to start with; and, not unfrequently, in spite of a long career of usefulness, turned out to be wholly erroneous in the long run.

"The geocentric system of astronomy, with its eccentrics and its epicycles, was an hypothesis utterly at variance with fact, which nevertheless did great things for the advancement of astronomical knowledge. Kepler was the wildest of guessers. Newton's corpuscular theory of light was of much temporary use in optics, though nobody now believes in it."

3. Skill in devising means of testing the truth of guesses.

4. Willingness to abandon an erroneous guess or hypothesis.

Kepler succeeded though handicapped by slowness and by poor calculations.—In addition to these characteristics of reflective thinking as found in the work of great scientists, it is interesting to note that Kepler succeeded wonderfully in spite of certain personal handicaps. For example, "He was not even a good arithmetical calculator, often making mistakes, some of which he detected and laments, while others escaped him to the last." When one recalls what an important factor mathematical precision is in modern scientific method, he can appreciate what a handicap Kepler labored under. Moreover, he was not *rapid* in devising means of testing his suppositions, but he compensated for this lack "by his courage and perseverance in undertaking and executing such tasks." In general, these characteristics of Kepler suggest that a person, for example, a pupil, may be a very competent thinker and, in the long run, very successful in solving problems, yet be very slow and laborious in his methods of criticism and verification.

Scientific biographies reveal "how we think."—Such accounts as Whewell gives of the personal efforts of scientific workers to solve problems help us to understand the actual mental processes involved in skilled thinking. On the basis of this understanding, we can proceed to give pupils practice in doing similar thinking. In recent years the psychological writings of William James and John Dewey have especially emphasized the nature of these thinking *processes*. From their discussions educators may derive help in understanding "how we think" and how to practice pupils in thinking. In the next article, we shall present briefly Dewey's description of "how we think" and then conclude the series of articles with section IV on "rules for practicing pupils in problem-solving."

[*To be concluded*]

CHARACTER AND RESULTS OF SPECIAL ROOMS AS CONDUCTED IN THE WHITTIER SCHOOL[1]

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Perhaps the most distinctive feature of the Whittier School is the manner in which we care for all the pupils according to their individual abilities. The practice of giving all pupils the same course of instruction and expecting them to accomplish it in the same length of time, regardless of their varying mental capacities, has long been the source of severe criticism by thoughtful students of education. It is evident in every school that the incapable are a drag on the class and the exceptionally bright ones are held back. Many plans to relieve this condition have been tried in different parts of the country with varying degrees of success. We believe that within the limits of our equipment we have a workable and successful plan. It is the object of this article to explain the plan and give evidences of its success.

To take care of these children of varying abilities, we maintain three distinct classes of rooms:

1. The regular rooms, caring for the great majority, those falling within the normal group.

2. A room for the "accelerates." These are of two distinct types: (*a*) children of superior ability whose native intelligence is in advance of their chronological age; (*b*) retarded normal children who are capable of doing more than the average of the classes to which they belong.

3. Rooms for "retardates," including pupils merely retarded and subnormals or those who are mentally incapable of getting all of the work of the grades, or are very much slower in acquiring than the normal children. The subnormals require a modified course in academic studies and a great deal of manual work.

[1] The Whittier School has an average enrolment of about 950 pupils.

We have one room devoted to accelerating the children of exceptional ability and normal children who have for some reason become retarded, but who are capable of more rapid advancement than the average of the class. Our plan is to have two classes of different grades in the room at the same time, aggregating twenty to twenty-five pupils.

For a number of years these pupils were selected on their standing in their classes, their age, physical condition, and power of application. In recent years group intelligence tests have been added as a determining factor. It is worthy of note that the child must have power of continued application to succeed. Mere spurts of exertion when some special tests are given, or superior native ability without power of continued application will not avail. The value of the psychological tests lies in determining the mental age of the child as a safeguard against advancing him beyond his mental limitations.

The task of the special teacher is to prepare these children to do the work of the regular class one-half grade just above. Long experience has shown that the time required to accomplish the work is about nine weeks, or half the semester, giving opportunity for four different groups during each year. All the essential work of the grade is taken, nothing important or necessary to an understanding of the advanced grade being omitted. With the small number of pupils in the room, omitting some of the special subjects for the time being and intensifying on the main subjects, the work is easily completed in the nine weeks. These pupils are then placed in the regular room with the advanced class and another group is selected for the special room. Whenever we have not found a sufficient number of gifted children of the particular grade selected to make up the quota for the class, we have taken from the class just above backward children who seemed to need some special help to keep them from failing. This, however, has not always been necessary. Sometimes we are not able to accommodate all who truly are prepared for the opportunity. But as this works as a wheel of opportunity it is sure to return again within a year and the child may then be among the best and be selected.

It is no longer an experiment, for such a room for acceleration has been continuously and systematically maintained on this plan

for the past ten years. From eighty to one hundred children are given this opportunity each year.

The results of each year differ very little. A summary of the teacher's record for three years is here given:

	1916–17	1917–18	1918–19
No. of different pupils in room during year	107	105	92
No. receiving special promotion	82	77	82
No. pupils saved from demotion	20	18	7
No. unable to do the work and returned to regular room	4	3	2
No. withdrawn before promotion	1	7	1
Advancement in age on receiving special promotion:			
No. advanced 6 months to 1 year	24	15	12
No. advanced 1 year to 1½ years	10	11	5
No. advanced 1½ years to 2 years	4	0	5
No. advanced 2 years or more	1	2	0
No. of normal age	17	19	28
Still retarded on receiving special promotion:			
No. retarded 6 months to 1 year	8	6	12
No. retarded 1 year to 1½ years	9	12	9
No. retarded 1½ years to 2 years	3	8	5
No. retarded 2 years or more	6	4	6

Careful record is kept and observation made of these children after special promotion and it is found that as a rule the large majority of them continue to be among the best in the class. Rarely one fails and loses what he has gained. The summary record of this room for the past four years is as follows:

Total special promotions	320
No. of different pupils making two promotions	31
No. making three special promotions	3
No. failing in next regular promotion after special promotion	8

To illustrate the exact manner in which the plan is carried out, we give the formation of the four different groups of children in the room for 1918–19:

During the quarter beginning September 3, 1918, the two classes consisted of

10 pupils in IV B working for IV A
3 pupils reviewing in IV A working for IV A
14 pupils in VI B working for VI A

The second quarter:

8 pupils in IV A working for V B, becoming VA at end of semester
5 pupils reviewing in V B working for V B, becoming VA at end of semester
10 pupils in VI A working for VII B, becoming VII A at end of semester

The third quarter:

11 pupils in VA working for VI B
9 pupils in VII A working for VIII B

The fourth quarter:

11 pupils in VI B working for VI A, becoming VII B in June
9 pupils in VIII B working for VIII A, becoming IX B in June
1 pupil in VIII A working for VIII A, becoming IX B in June

An analysis of these figures shows that had any pupil beginning with either class in September continued with the class till the end of the year in June, he would have made three full years' work in one. This would be phenomenal and would likely be too great a tax upon even a very superior child; but by giving only one promotion at a time, or at most, two in succession, the four special promotions have frequently been accomplished before leaving the eighth grade. These specially gifted children generally receive one or more special promotions before leaving the primary grades.

If a child is capable of making more than one special promotion, he is retained in the room with the new class entering, or he may be returned to the regular school and be selected again when the opportunity comes. Some children have made as many as four special promotions before leaving the eighth grade. Our aim is to advance them to a point where they will find opportunity for the exercise of their superior intelligence. It is based on the theory that when a child has once reached the grade corresponding to his intelligence quotient he will then be required to put forth a normal effort to keep up with his class. This we believe to be more practical than to segregate the superior children into permanent groups.

The "accelerates," when measured by the psychological tests, have in no case been found to be advanced beyond their mental age. It is worthy of note that when a child has been advanced to

the grade corresponding to his mental age he still is able, without superior effort, to do good work in the advanced grade, proving the correctness of our standard.

In May, 1917, Dr. Frank Clapp, of the University of Colorado, gave to our regular fifth, sixth, seventh, and eighth grades, aggregating some three hundred and fifty pupils, standard tests in English and arithmetic. These results showed our median slightly above the average of all the schools tested by him, but not so many pupils with very high or very low scores. This tends to show that we are attaining what we are aiming at, viz., more even grading. The children are worked to their normal capacity without overtaxing the poor ones or undertaxing the good ones.

The Pressey Group Intelligence Scale was used by Miss S. Alice Russell, Director of Special Schools, in testing two hundred and forty-four Whittier School pupils of the fifth, sixth, seventh, and eighth grades, for the purpose of determining the correlation between the school rating and the intelligence score of the pupils selected for the classes for accelerates and retardates. The tests were made in June when, with the exception of the retarded group, all the children were ready to be advanced by promotion. The pupils are classified in this report in the grade to which they were promoted on June 27, 1919.

The scale used is arranged in ten tests so graduated in difficulty that children from the third grade to high school can be examined for classification by grades and ages. The authors believe that children who score above the 90 percentile show superior endowment and that below the ten percentile we may look for cases of mental deficiency.

The tests were given to the three following groups:

Group I, consisting of one hundred and forty-two pupils from the fifth, sixth, seventh, and eighth grades, all of whom had been enrolled one or more times during the past four years as students in the special class for accelerates. Each child had made one or more special promotions. The one hundred and forty-two children examined included all the pupils that had been enrolled in the class for accelerates who were still attending the Whittier School in June, 1919.

Group II, consisting of fifty pupils from the fifth, sixth, seventh, and eighth grades, who were of the normal age for their grade and who had never received a special promotion nor had been given an opportunity to work in the special class.

Group III, including fifty-two retarded pupils from the fifth, sixth, seventh, and eighth grades of the special classes for retarded children.

Detailed data show the following striking results: 70 per cent of Group I were above the grade median; 60 per cent of Group II were above the grade median; 23 per cent of Group III were above the grade median.

TABLE I

ANALYSIS OF SCORES OF 244 PUPILS CLASSIFIED AS ACCELERATES, NORMAL, OR RETARDATES AS TESTED BY THE PRESSEY GROUP INTELLIGENCE SCALE

	GROUP I	GROUP II	GROUP III
	142 Accelerates (Ages 9–16)	50 Normal (Ages 5–14)	52 Retardates (Ages 12–17)
Percentage scoring above 90 percentile superior	22.5	8	4
Percentage scoring between median and 90 percentile average to superior	48.0	52	23
Percentage scoring between median and 10 percentile average to poor	27.0	38	50
Percentage scoring below 10 percentile deficient	2.0	2	23
Percentage above median	70.5	60	27
Percentage below median	29.5	40	73
	320 special promotions	No special promotions	Three to five years' retardation

Two per cent of Groups I and II and 23 per cent of Group III were below the 10 percentile and were cases requiring individual diagnosis.

Group I represented one hundred and forty-two children out of two hundred and eighty-three who were members of the class of accelerates during the past four years. This class made three

hundred and twenty special promotions during the four years, with an approximate saving to the city of $8,000.

To supply children for the rooms for "retardates" the surrounding districts are tributary to the Whittier School. "Retardates" fall into two distinct groups: (1) Retarded children, capable of doing the regular work of the grades, and having power under favorable opportunity of being restored wholly or in part to their places with the normal children. (2) The borderline cases and those of the subnormal type with marked and varied mental limitations.

Experience has shown that to put these two classes together in the same room simply because they are equally retarded is a very poor solution of the problem. The mistake is in attempting to yoke together the capable with the incapable, those with power to forge ahead with those without that power. For this reason we segregate them and place them in different rooms. In addition to the room for "accelerates" we at present have two rooms for the restoration classes. These do chiefly academic work and follow as closely as possible the regular course of study. Pupils are retained indefinitely in the special rooms and are advanced as rapidly as they can do the work.

We have four rooms for the second type, limiting the number of pupils to about twenty per room. These children are not capable of learning all of the academic work of the grades, and are furnished in these rooms such instruction as is profitable to them. Industrial work has become an important part of the education of the subnormals. They spend about one third of their time in manual work. The boys are given four periods a week in sloyd instead of one period allowed the normal classes. At the same time the girls are taught cooking, sewing, and other useful household arts. In addition to this, both boys and girls are taught to make many articles which have a commercial value.

Beginning in the primary grades, the simplest kinds of handwork are taught. In learning these simple processes the finished product at first is often a crude, unsightly piece of work; but it represents a continued effort and struggle of the clumsy, untrained fingers of the average subnormal child. To one experienced in working

with defective children, the finished article, no matter how disfigured with blunders and mistakes, is a work of great value, because of the concentrated effort and valuable training it represents. It is often only after months of practice that one of these pupils completes his knowledge of a simple process like weaving; then he is ready to turn out a finished, attractive piece of work. His training is continued through the grades, increasing in difficulty as his abilities develop until he finally masters a number of different processes.

The following is a partial list of the articles made in the special rooms:

1. Reed and raffia articles: baskets, mats, hammocks, shopping bags, art trays.

2. Woven articles: caps, sweaters, mats for hot dishes, hammocks; rugs, commercial sizes, ranging in value from $0.75 to $2.50.

3. Crochet list: lace edgings, yokes, boudoir caps, doilies, bags.

4. Sewing list: art bags, shopping bags, pillow tops, pin cushions, handkerchief cases.

5. Miscellaneous list: wire baskets, hammock swings, twin shopping bags, looms.

These children are fond of the manual work. This varying of the course of instruction to meet the individual capacity of the child is the golden charm of the system. Instead of being distasteful and irksome his school tasks become a delight. He has found something he can do and he cheerfully puts forth his energies to accomplish it. He likes his school and truancy is as rare here as in the regular rooms.

It is a well-known fact that the criminal class is continually recruited from the mentally weak. This is easily understood when we consider the manner in which these children have usually been treated. Actually forced out of school by reason of requirements too great for their capacity, and incapable of holding any job, they run the streets and naturally drift into criminality. It is not so when these children are provided with such schooling as fits their mentality. As a rule when these pupils reach the seventh or eighth grade (some of them never do) they have become orderly

in conduct and habits and have attained a considerable degree of proficiency in the elementary subjects, though they are still greatly retarded. By reason of the care and training thus received they generally grow into responsible, law-abiding citizens, capable of taking care of themselves. The extra expense required in their education is more than justified by the quality of citizenship produced.

With the superior children advanced to a degree at least approaching their mental capacity, the inefficient and incapable removed to separate rooms, the effect on the main school throughout the building is marked. The pupils are more evenly graded, and the energies of the teachers can be directed mainly to the large normal class, all having common interests and common problems. The result is less nerve strain on both teacher and pupils, and a better and higher class of work is accomplished.

THE ADDITIVE VERSUS THE BORROWING METHOD OF SUBTRACTION

WILLARD W. BEATTY
State Normal School, San Francisco, California

In the November, 1919, *Elementary School Journal* appeared an article by Joseph S. Taylor, District Superintendent of Schools, New York City, setting forth the results of a survey conducted by him into the results of additive subtraction teaching in the New York schools. Briefly, Mr. Taylor presented the following: Beginning with the school year 1912-13, the New York City schools determined upon the teaching of subtraction exclusively by the Austrian or additive method. During the spring of 1919, a survey was made of the results in districts one and seven. Children of the fourth, fifth, and sixth grades (those who presumably have never been taught anything but additive subtraction) were requested to tell the method which they followed in performing the simple subtraction, $\begin{array}{r} 61 \\ -29 \end{array}$. Three questions were asked:

a) How many say: 9 from 11 = 2; 2 from 5 = 3?
b) How many say: 9 from 11 = 2; 3 from 6 = 3?
c) How many say: 9 and 2 are 11; 3 and 3 are 6?

TABLE I

Method	Number of Children	Percentage
a	2,483	21.8
b	4,625	40.6
c	4,260	37.6

A summary of the results is given in Table I. It is seen that less than half of the children are using the additive method. Summarized by grades, the facts appear as shown in Table II. This proves, Mr. Taylor concludes, that "by the time the children reach the sixth grade, seventy-eight out of every one hundred subtract by a method which is officially excluded from the schools." Mr. Taylor further points out that, theoretically, the desirability

of the additive method is subject to discussion, and by no means a proved case.

Despite the force of Mr. Taylor's figures, it is still possible to question the conclusions which he draws. It is fair to assume that, in spite of the fact that the Austrian was the prescribed method, a large number of teachers may have persisted in following earlier methods of instruction. The increasing proportion of additive-process cases found in the lower grades might indicate that the irreconcilables were being replaced by new blood more favorable to the newer method, or that closer supervision was forcing observance of the additive method.

As nothing is to be gained by argument, an interesting experiment is presented instead. The elementary department of the

TABLE II

Grade	Per Cent Using		
	Method a	Method b	Method c
IV	13.9	33.4	52.7
V	22.4	41.2	36.4
VI	31.6	47.2	21.2

San Francisco Normal School has been teaching subtraction by the additive method for sixteen years. This has also been the method of the California state text for nine years, and presumably has been taught in the San Francisco schools during that time. The children of the grammar grades of the elementary department have been taught subtraction in one or the other of these places. A survey of the sixth, seventh, and eighth grades, similar to that made by Mr. Taylor, should shed some interesting light on the question of additive subtraction.

The same problem used by Mr. Taylor was presented for oral subtraction. The results appear in Table III.

With the data positively in hand—that is, figuring purely upon the 83 cases taught and tested in the San Francisco Normal School—51.8 per cent of the children have in four or five years abandoned the additive and adopted the borrowing method. Of the San Francisco public-school products, where of course we have no

means of knowing exactly how subtraction was taught, more than 78 per cent of the children are using the borrowing method.

An interesting question now presents itself, which is of course not new, and that is the relative efficiency of the two methods. To determine this the Courtis Standard Test—Series B in subtraction was given, with the results presented in Table IV.

TABLE III

	Total	Additive	Borrowing	Early Italian	Mixed
Pupils taught at San Francisco Normal School	83	40	43	.....	.....
Pupils taught in San Francisco schools	92	14	72	1	5
Total	175	54	115	1	5

Summarizing briefly Table IV, the pupils using the additive method are shown to be more accurate, by a considerable amount, but

TABLE IV

Method	Number of Pupils	Percentage with 100 per cent Accuracy	Percentage Missing One Problem or Less	Percentage above Courtis Sixth-Grade Standard	Median Rate	Median Accuracy
Additive	52	35.0	63.4	21.0	8.2	81.7
Borrowing	123	19.5	51.2	28.4	9.2	79.3

somewhat slower than the borrowing-method pupils. This slowness is shown by the median number of problems attempted, and again by the percentage of pupils exceeding the Courtis sixth-grade standards.

The conclusion to be drawn from the foregoing facts is that the prescription of one method only for teaching subtraction is certainly not justified by the evidence. That the preferable method of teaching subtraction is the additive method is certainly shown to be open to question. While the advantage in point of accuracy seems to be with those who have retained the additive method, the question arises: If those using the borrowing method were able to do more rapid work with a means which they adopted in spite of their instruction, what would they have been able to do had they been trained from the beginning in the method which they unquestionably prefer?

THE TEACHING OF SPELLING

GERTRUDE E. MARTIN
Washington School, Wichita, Kansas

Said one little lad in my fifth grade, "I used to hate to come into the room for spelling, but now I can hardly keep from rushing in! Since I made the first 100, spelling has seemed just like a game." Another said, "In the school I came from, we used to think it wonderful if four or five pupils made perfect grades. Here, we are surprised if that many do not make 100." These are but two of the many voluntary testimonies regarding the success of the method used in my spelling classes during the semester just ended.

When I was assigned the teaching of fourth- and fifth-grade spelling in a departmental program last fall, I resolved to teach that very necessary subject as I had never before taught it. Before the term began, I read carefully Suzzallo's *The Teaching of Spelling* and an article on this subject by Professor Ernest Horn, in the *Eighteenth Year Book of the National Society for the Study of Education*. These articles, with a few ideas of my own as to their practical application, produced results which seem worthy of mention to others who may be interested in securing better results in their spelling classes.

Briefly, the main points of my method are these:

1. Definite assignments for a somewhat extended period of time.
2. Careful use of uniform notebooks.
3. Review and trial lesson of week's work on Monday.
4. More teaching and less testing.
5. Individualization of the child's problem.
6. Weekly test on Friday.
7. Posting of individual and class records to remain permanently in view.
8. Encouragement for each to surpass his own record.
9. The general plan for the week's work varied enough to keep interest and enthusiasm at the highest point.

The following records refer to the work of four grades of the Washington School, Wichita, Kansas, and cover one semester which was divided into three periods of six weeks each. The 4B class contained about 42 pupils; the 4A, about 48; the 5B, 35; and the 5A, 36. The 4B and 4A classes had the same assignment, as did also the 5B and 5A classes.

When work began in the fall I posted, where they were to remain throughout the semester, the following outline for the fourth grade and a similar one for the fifth grade:

FOURTH-GRADE SPELLING ASSIGNMENT

First Semester: Pages 42 to 53—Lessons 1 to 82.

Each Period: About 27 lessons, and review. Pronounce, spell, mark, and use each word in a good sentence.

	First Period Lessons	Second Period Lessons	Third Period Lessons
First week	1 to 6	30 to 35	61 to 66
Second week	6 to 11	35 to 40	66 to 71
Third week	11 to 16	40 to 45	71 to 76
Fourth week	16 to 21	45 to 50	76 to 80
Fifth week	21 to 26	51 to 56	80 to 82
Sixth week	26 to 30	56 to 60	.....
	Review	Review	Review

This was a great convenience to all, especially to the teacher, to new pupils, and to pupils who were absent occasionally. Such a careful assignment is based upon my theory that a teacher should explain exactly what is expected of the pupil and then require his utmost effort in fulfilling the demands made upon him.

The plan of procedure was made so attractive that the children were delighted to bring five cents each to pay for the notebooks which had already been purchased. For the sake of neatness and uniformity, these books were plainly labeled by the teacher; and it was made clear that no attempt at adornment (?) was to be made by the pupil throughout the term!

Remembering that color delights the child's heart, I promised to check with a colored pencil, sometimes red, sometimes blue; and to write "Good" or "Excellent" or "O.K." when merited. The pupils were urged to beware of "C," which stood for "Careless"; and they were asked to obey promptly the summons,

"Come to me," which was an offer of special help. In short, each book was to be a "thing of beauty and a joy forever"—a gift for mother and father at the end of the semester; and a memento of which the author could be proud when old age should overtake him.

It was an eventful morning when the first pages were headed: "First Trial Lesson—September 13, 1919." Preparatory to writing more on this page, each eager child sat with spelling book open at page 42, lessons 1 to 6. While *looking* at the correct *form* of the words, the children *heard* the correct *pronunciation* as a few good sentences were given by teacher and pupils. Any peculiarities in spelling were briefly noted, and the words were discussed in an easy, friendly manner. The ideal presentation of a spelling lesson is thus described by Suzzallo:

> The spelling period in the best of the modern classrooms is no longer preeminently a formal and meaningless translation of sight symbols into sound symbols, and vice versa; but a natural and interesting exercise in which plays, dramatizations, objects, pictures, and conversations are characteristic instruments in approaching the spelling of words. The teacher has simply made his teaching natural to life in spite of the fact that he is confronted with an artificial situation.

We attempted this in our classroom; then spellers were closed, the words were pronounced by the teacher, and written in the notebooks. During the day, or Monday evening, the *teacher* carefully checked all errors, including a missing dot for "i" or cross for "t." The check mark was used after misspelled words; the decorative "Good," "Excellent," and "O.K." were written in, and also such admonitions as the various cases required; but no per cent grades were given in these books. When the books were returned to the pupils on Tuesday, each proceeded to write in a *correct* list of *all words he had missed*, and to begin the mastery of *his own* problem. Those who had made but few mistakes proceeded at once to the use of the dictionary, the marking of words, and the building of sentences. Tuesday, Wednesday, and Thursday were spent in individual teaching. There was no *testing* and no *grading* during this period. Questions were answered and help was given in varied and interesting ways. The teacher of spelling should keep in mind Suzzallo's statement: "A word is

never well taught unless the teacher makes certain that the pupil has (1) its meaning, (2) its pronunciation, and (3) its spelling. And these three factors must, of course, be known in full and appropriate association." To this end I used every device which I could discover or originate to interest and instruct.

The children found that most of their sentences were statements and made an effort to give exclamatory, imperative, and interrogative sentences also. Enough oral spelling was required to insure a knowledge of syllabication, and the children were led to see the value of this. In the teaching of diacritical markings, constant use was made of our "sound table"—*A: āte ăt ärm a̤ll a̤sk wa̤s âir; E: mē ĕgg thêre hĕr the̤y; I: īce ĭt machïne gĭrl;* with similar illustrations for the other vowels and diphthongs. Each child had a typewritten copy of this table pasted in his speller and there was also a table on the board for ready reference. When the children realized that they need not *guess* at the sounds but could be as *sure* of such work as of their results in arithmetic, they began to enjoy it, and to plead for "sound contests," which were often granted.

By Friday the children were on the tiptoe of expectancy for the weekly test. In this test, everyone sought a *perfect* grade—not merely a *good* grade; and the following records are on *spelling* alone. For the teacher's convenience in grading, just twenty words were given in each test. A test paper held four tests, and at the end of four weeks it was sent home to receive the signature of one or both parents, after which it was to be returned to the school. In some cases this secured the much desired co-operation of the parents; and often they added statements which gave the teacher an insight into home conditions.

Early Monday morning the individual record of every child was posted on the board, the names of the boys and girls of each grade being arranged separately and alphabetically. For example, the grades for the weekly tests for a few 4B class pupils for one period appear in Table I.

The summary of one weekly test—the one given at the end of a stormy week succeeding the Christmas holidays—is given in Table II. Out of 149 grades, 101 were perfect, and not one was below 80.

There was always friendly strife for class championship, and records to show the number of perfect grades made by each class were posted as in Table III.

At one time the 4B's called themselves "tortoises" in a race with the 4A's, who were called "hares." For a time it seemed

TABLE I

4B SPELLING—FIRST PERIOD

	First Week	Second Week	Third Week	Fourth Week	Fifth Week	Sixth Week
Clarence	45	100	85	85	100	90
Ivan	70	65	50	80	100	80
Donald	70	100	80	70	100	90
Ellis	80	85	95	100	100	95
Velma	65	80	80	70	100	75
Bertha	45	75	95	85	95	80

TABLE II

	Number in Class	Absent	100	95	90	85	80
4B	42	4	28	6	3	1	0
4A	48	3	27	9	7	1	1
5B	35	1	21	8	2	3	0
5A	36	4	25	5	1	1	0
Total	161	12	101	28	13	6	1

TABLE III

FIRST PERIOD—NUMBER OF 100'S MADE BY EACH CLASS

	Number in Class	First Week	Second Week	Third Week	Fourth Week	Fifth Week	Sixth Week
4B	42	4	11	9	8	26	4
4A	45	23	21	16	21	25	18
5B	30	12	16	19	11	11	10
5A	35	24	21	16	24	20	11
Total	152	63	69	60	64	82	43

impossible for the tortoises to win, but one morning they found themselves at the finishing stake first, the victory was sketched on the board, and there was great rejoicing.

At the end of the second period we spent one morning in "taking stock" of ourselves, in looking *backward* and *forward*. Little Ivan,

in 4B, after examining his notebook intently, volunteered the remark, "I'd be ashamed to show the first of my book to anybody, but I could show the last pages to *anybody!*" There were many similar cases.

The children then enjoyed writing in their books a little note, of which the following is an example:

During the second period the 4A's held the championship in spelling for five weeks.

We made 176 of the 546 perfect grades made by Miss Martin's four classes. The 4B's made 113 perfect grades; the 5B's made 125; and the 5A's made 132.

We think we can do still better during the third period.

At another time—just after the names of the months had been studied—the little poem entitled "The Months" was carefully written in the books. Thus from time to time various interesting features were added.

At the close of the semester, the eighty lessons studied were divided into eight reviews of ten lessons each. Each day for eight days, twenty words selected from the ten assigned lessons were given with no special drill. The results are shown in Table IV.

TABLE IV

Class	Number of Tests Given	100	95	90	85	80	75	70	Below 70
4B.....	314	103	67	51	33	21	16	6	17
4A.....	369	195	73	30	21	14	13	7	16
5B.....	277	104	74	45	27	11	3	4	9
5A.....	272	119	52	42	26	13	6	5	9
Total.....	1232	521	266	168	107	59	38	22	51

Regarding this review each child wrote a final page in his book. In quoting one of these, it is but a repetition of Table IV, but it shows how *the child* was given an opportunity to understand and enjoy everything that was done. Loren's note follows:

We have just reviewed all of the semester's work. We took ten lessons each day for eight days. We wrote twenty words for each test, and *my* grades were 80, 100, 100, 100, 100, 100, 100, 100.

Of the 369 grades in *my* class, 195 were 100; 73 were 95; 30 were 90; 21 were 85; 14 were 80; 13 were 75; 7 were 70; 16 were below 70.

The children were given the responsibility of initiating new pupils into our plan. They watched the individual records and asked to help the pupils who occasionally fell in their grades. When "Missouri" or "Oklahoma" enrolled, and gave evidence that he was a victim of the poor-spelling habit, a friendly class spirit intimated to him that it would be wise for him to adopt the revised proverb, "When in *our* class, spell as *we* do," and the new pupils invariably began at once to raise their grades.

Whatever success has attended our work is due to the fact that the children were made acquainted with the plan and furnished with a motive for constantly improving their own records, that interest was sustained in every department of the work, that each child was constantly at work upon his own problem, that pupils and teacher were enthusiastic in attempting to *win out* in the spelling game.

A CO-OPERATIVE COMMUNITY STUDY

SARAH MARK IMBODEN
Supervisor of Elementary Grades, Decatur, Illinois

The problem method of attack in the teaching of geography, as opposed to the ineffective traditional method of instruction, is becoming fairly well established in most progressive school systems. The fifth-, sixth-, seventh-, and eighth-grade pupils of Decatur, Illinois, have just written and published a book of 192 pages entitled *City of Decatur*.[1] From the preface, written by the supervisor, one can see the reasons for initiating the project.

In planning the work of this book to be written by our upper-grade pupils, the supervisor wished to accomplish several things:

First, to assist in working out a geography project to demonstrate to the teaching body the feasibility of the problem attack in teaching and to help teachers get away from the traditional method of testing the assimilation of facts gleaned from a textbook—facts which often fail to interest the child because he has not the apperceptive basis with which to interpret things remote.

Second, (*a*) to set up a situation which would give the child as intimate an acquaintance as possible with his own immediate environment; (*b*) to build up the child's concepts through direct observation and actual experience so that he might have a more vivid and accurate mental image of that which must be gotten indirectly through readings and pictures; (*c*) to build up a body of principles in regard to city growth and importance which would enable him to apply the knowledge gained to other cities studied; and (*d*) to provide an experience appealing to the child's interest and motivating English as well as geography.

The following quotation from the Introduction written by the superintendent, Mr. J. O. Engleman, points out some of the educational values derived from such a study:

Education is life and must increasingly deal with life to be vital and significant. More and more must pupils learn to look beyond books and beyond the schoolroom for their subject-matter worthy of study. More and more, as they advance through the grades and the high school, do they need to study nature and man—nature in field and forest and soil and stream, and man on the farm

[1] Copies may be purchased from the Public School Office, Decatur, Illinois, at $0.75 per copy.

and in the city, man in his organized and institutional efforts to promote the social good which we call civilization.

Any city, any community, indeed, is a laboratory of greater or less excellence for such study. When rightly directed and pursued, such a study may be made to yield rich returns that may reenforce much conventional and traditional teaching of language, spelling, reading, numbers, and geography, but more than that, it results in a habit of mind toward institutions surrounding the school, widens sympathies, extends the mental horizon of pupils, and multiplies the school's points of contact with life in its various institutional forms.

In such a spirit, and with such a conviction, the study resulting in this book on Decatur was undertaken.

A reading of the table of contents will show the wide scope of the book.

Foreword. Spirit of Decatur

CHAPTER

I. History of Decatur
II. Decatur as an Educational Center
III. Institutional Decatur
IV. Industrial Decatur
V. Decatur's Transportation Facilities
VI. Public Buildings
VII. Churches and Civic Organizations
VIII. Decatur's Department Stores
IX. Government of Decatur
X. Beautiful Decatur
XI. Decatur's Future

The information was gained through observation, study, and research. Where it was not practicable to visit a factory the necessary data were gotten by the pupils writing letters to the heads of concerns listing questions they wished answered or, as in many cases, inviting the persons to talk to them.

Old records, newspapers, and local histories were read that statements might be authentic. I feel confident from the untiring energy, interest, and enthusiasm on the part of the teachers who directed the work and from the reactions of the pupils that all concerned felt they were engaged in "a whole-hearted, purposeful unit of activity."

The introductory paragraphs of the few studies given below show how thoroughly the topics under consideration were discussed and developed.

DECATUR AS A RAILROAD CENTER

As a railroad center Decatur ranks second among all the cities of Illinois, Chicago, of course, being first. Of the various factors working together to establish this city thus high among the commercial cities of our state, the transportation facilities undoubtedly lead. It is true that the wonderful fertility of the surrounding area has caused rapid growth of many large cities which make a splendid market for our manufactured products. In this territory, surpassing any in the world in the value of its productive acres, agriculture is carried on extensively. This means that manufacturers of farm implements will find a splendid market for their products. Valuable land tends to create a general prosperity among the people living on it. Prosperous people coming into the city to buy and sell aid materially in its commercial development. Nothing, probably, has helped more in getting these outside people interested than the business men who through their aggressiveness arouse the people and make them aware of their city's commercial standing. But these two factors are of minor importance when we consider what the transportation facilites have done in developing our city commercially. A glance at the map will show us why we should be so fortunate. Centrally located in a rich territory, the city attracts builders of railroads. Lines crossing the state from north to south or from east to west pass through here. Not only is it centrally located in the state, but among the cities of the entire nation it stands almost in the center. As a result, traffic of all kinds must pass over these lines.

DECATUR'S WATER SUPPLY

When a family or factory chooses a new location, one of the most vital features of the place to be considered is its water supply. Water must be plentiful in case of drought or fire and adequate for the use of factories. It must be pure to prevent disease, and should be reasonably priced to keep down the high cost of living.

LEADER IRON WORKS

As people became more progressive, they began to pay more attention to the importance of proper sanitation and conveniences about their homes and began to demand better living conditions. One of the chief necessities in this progress is a water system.

The founders of the Leader Iron Works had a water supply system to offer to every farm and suburban home in the country which did not have the conveniences of a water system furnished to them by a city water works.

In looking for a desirable location the city of Decatur attracted the manager of the Leader Iron Works for several reasons. First, it offered as a railroad center excellent shipping facilities for the receiving of its raw materials which came chiefly from Chicago and Pittsburg milling districts, also for the shipping of its finished products to other cities. It also offered an available supply of

fuel close at hand. In addition to this, Decatur was located in the center of the great middle west agricultural section, which brought most of its products here for market, and having the advantage over many other manufacturing cities it offered good housing conditions for employees. This overcame many of the hardships encountered in the congestion of the larger cities.

The lesson plan given herewith is fairly indicative of the general method of procedure.

I. General explanation of the plan for writing a book on Decatur.

II. Discussion of our part. Class suggestions as to what our chapter should contain.

III. Oral discussion, followed by written questions of points about which we would have to be informed. Such questions as these were asked: (1) How old is Decatur? (2) Were there any railroads when Muellers began? (3) What did Muellers at first manufacture?

IV. Mr. Mueller's son was asked to talk to us. Children questioned.

V. Discussion of Mr. Mueller's talk. Checking up to see if our questions were answered satisfactorily.

VI. Gathering material from *Mrs. John's Personal Recollections; Mueller's Fiftieth Yearbook; Monthly Mueller's Magazine.*

VII. Discussion of main heads for written work: (1) past history; (2) present history; (3) future possibilities.

VIII. Under each of these heads were placed sub-topics as indicated in the paragraphs.

IX. The proper arrangement of each paragraph was discussed. For example, which should come first, "The Invention of the Water Tapping Machine" or "Branch Factories."

X. The outline was as follows: (1) Introduction; (2) Mr. Mueller in Germany; (3) His first business; (4) His invention; (5) Beginning of a factory; (6) Growth; (7) Branch factories; (8) Raw materials; (9) Employees; (10) Welfare work; (11) War work; (12) Muellers and the World's Fair; (13) Shipments; (14) Future plans; (15) Closing paragraph.

XI. The introduction was written as a class exercise.

XII. The class was divided into groups, each group having one or two captains. For instance, one group took No. 2; one, 3; one, 4. Each individual was to make his written contribution after an oral discussion in class. The business of the captain was to select from the papers of his group the best points and the best modes of expression. He checked the best points on each paper and rearranged them, probably using some of his own. Then the class checked up his paragraphs. The captain read it as a whole, then sentence by sentence. The teacher wrote it on the board and directed the corrections while all members of the class made suggestions. Then the paragraph was copied by two or three of the children. One was chosen to be kept by the teacher.

Form was about the only point judged here. This plan in general was followed in preparing the other paragraphs.

XIII. The next step was to read it as a whole and work for unity. The beginning and ending sentences were studied especially to show the relation between paragraphs.

XIV. Repetition of words such as factory, Mueller's, etc., were noted and substitutes were made. To shorten the chapter unnecessary material was omitted.

XV. Place geography. Pointed out cities receiving shipments, regions furnishing raw material. Contructed maps showing same.

XVI. Interesting discussions not included in the written report: (1) Picturing Decatur as Mr. Mueller saw it; (2) Draining land; (3) Prairie grass; (4) Growth of Decatur; (5) Supply and demand; (6) Education and Religion in foreign lands. Work of missionaries in promoting sanitary conditions; (7) Could the company afford to educate natives of Mexico and South America to a need of plumbing supplies? (8) What large factories are doing for their employees; (9) Why Muellers haven't an office in the West; (10) How Mueller's new location will affect southwest Decatur.

In writing of the values of this type of work one teacher says:

From the standpoint of geography we learned a great deal, such as the six essentials of manufacturing; the interdependence of our city and people and other places far and near; the value of being a keen observer of home conditions in and concerning a factory; the source and nature of the raw materials used; the location of places from which raw products come and to which the finished product is sent; a study of railroads and interurban lines and the density of population of the United States.

Another teacher says:

The fact that he paid them a personal visit in their own room, talked with them about his inventions and patents, that he was alive and really living among them, made their piece of work intensely interesting and, I feel, has meant more to them than any life they have read and studied in history books.

To say the boys enjoyed their part would be putting it mildly. One English period after the class had worked unusually hard in developing various words and phrases for certain paragraphs, I remarked that it was a difficult thing to do, but that we showed growth by accomplishing and mastering difficult things. One boy arose to his feet and said, "I don't call this hard work; I call it fun." I do not think there was a period devoted to this work that was not thoroughly enjoyed by every pupil present.

Another teacher says:

Each member of the class wrote an opening paragraph and was given a chance to read it in class. We decided upon the merits of two or three and had

the children put them on the blackboard. We culled, rearranged, added to and substituted other words until it met the approval of the class.

Bobbitt in his *Curriculum* advocates the development of a social standard of conduct which will enable capital and labor to get together in the right spirit and to see that their interests are inseparable.

The children have felt this, as is evidenced by the following:

One of the things that impressed me most in our work—The A. E. Staley Manufacturing Company—for the Decatur book was the loyalty and admiration of the pupils whose parents were connected with this company for the head of the firm. The children took particular pride in telling the things that Mr. A. E. Staley had done for his employees and not once was there any word that would indicate any dissatisfaction. As about half my pupils come from homes some member of which is employed by this company, it seemed remarkable. It was a splendid example of loyalty on the part of the employees brought about by the fairness and consideration of the employer, and, in this day of strikes and labor upheaval, it is well worth noticing. If the pupils have before them such examples, will not this tend to make them workers or leaders, as the case may be, who will stand for fair dealings and co-operation in work?

In their own words the children have said:

In this time of strikes, the A. E. Staley Company has not been affected by labor disturbances. This is due to the fact that this company is just to the employees, even to doubling the increase which union men were urging the employees to ask, and in this way the organization of a union was prevented.

Another way by which this company has showed its interest in the employees is the establishment of a store to reduce the high cost of living to the employees. This department is trying to serve the employees and this is appreciated by those employed because they get a good brand of goods at a lower price than they can be obtained elsewhere.

In addition to furnishing employees supplies at cost this company offered to put in the new impounding dam, which the city will have to do in order to have the necessary water supply, at the actual cost of labor and material.

This company has showed an interest in its employees socially. An athletic club and a band have been organized. An athletic park is provided by the company and financial aid given by the head of the firm. But the efforts of Mr. Staley do not stop at the plant.

He has encouraged the formation of a Home Bureau for the wives of the men employed by him and has offered a room for their use. Probably the influence of no one firm exerts as wide an influence in the life of Decatur as that of the A. E. Staley Manufacturing Company.

In writing of another factory the pupils say:

Within a few months this factory will be prepared to throw open to its employees ample sized lunchroom and restrooms with complete furnishings. This will afford for all those who participate in the comforts such opportunities as only a modern industry can extend to its employees. This means more rest and time for social intercourse among its employees.

"In what way will you share excess profit with employees—in increased wages or a bonus?" This was one of the questions formulated by the seventh-grade class in writing on Decatur's future.

It was the wish of the pupils to dedicate their work to the citizens of Decatur. Does not this show how much the personal interviews and letters from our citizens meant to them? Do they not show their feeling of gratitude to these, their "big brothers," when in the closing paragraph of the "Spirit of Decatur" they say:

The older citizens are leaving a rich heritage to posterity,—a city well organized as to government, well established business firms, good schools, beautiful parks, a growing university, churches with strong memberships, many and active civic clubs, up-to-date hospitals, secure banks and splendid homes. May the Spirit of Decatur use this heritage to promote a nobler, richer city in the future.

In the history, too, they express a similar sentiment:

A history of Decatur to be complete should contain some mention of those pioneer settlers who helped to preserve the nation's honor or served the country in some capacity. Indeed, there are few who did not do the latter. We have to our credit those who became historically famous, chief amongst whom are Abraham Lincoln, so rightfully called "a masterpiece of God"; Richard J. Oglesby, who served as major-general in the Civil War, as a United States Senator, and three times as Governor of Illinois; General Isaac C. Pugh, hero in the Black Hawk War, the Mexican War, and the Civil War; General Jesse H. Moore, who earned the rank of brigadier, given him by President Lincoln in April, 1865, for "gallant and meritorious service on the field of battle."

As to the latter, there were many of them—lawyers, doctors, preachers, school teachers, office holders, merchants, shoemakers, tailors, cabinet makers—all of whom served in providing for the comfort of the people and the development of Decatur, which is now a thriving city with a population close to fifty thousand, all of whom are engaged in pursuits which will tend to make our city continue to progress.

Can you imagine how much pleasure the following letter from the secretary of the Association of Commerce gave to Franklin,

one of our truants and incorrigibles, to whom this work made a strong appeal?

> It is very good to know that the boys and girls in the public schools today are taking such an active and intelligent interest in the affairs of our city, because in a few years more the entire responsibility for the direction and management of these affairs will rest upon the shoulders of the same boys and girls who are now trying to learn Decatur's resources and needs.
>
> Whatever our city becomes in size, in influence, in possessions, or in comfort will depend upon the wisdom with which we, today, and those coming after us may build. Too much attention cannot be given to our public affairs. Next to our homes, the city in which we live should receive our earnest and thoughtful consideration.

The value and attractiveness of the book are greatly enhanced by the art work—the cover design, title pages to chapters, and tail pieces. This work was done by the junior high school pupils under the direction of the art supervisor, Miss Effie Pearl Imes, and the special teacher in drawing, Miss Anna Mead.

One hundred copies of the book were hand bound by these pupils and given out as complimentary copies.

In the concluding paragraph of his introduction, Mr. Engleman writes, "May we not hope that this study will result in greater interest in the schools upon the part of Decatur's citizens as truly as in the greater and more intelligent interest in the city upon the part of its teachers and children." We feel that this will be true.

THE PROJECT METHOD IN TEACHING CIVICS

ANNIE L. JILEK
Theodore Herzl School, Chicago, Illinois

The Theodore Herzl School is situated in a portion of Chicago which used to be one of the prettiest residence sections of the city. The school is classed as one of the largest and best grammar schools of Chicago.

After the building was erected the problem arose, how to take care of this magnificent structure. It was solved by having each room form itself into a civic club and undertake some specific problem, such as taking care of the corridors, the fountains, the assembly hall, the pianos, the grounds outside, and so on. By developing civic pride and responsibility these clubs have shown not only what can be done to make the Herzl School clean and beautiful, but how to make Chicago itself a better place in which to live.

The cycle of time brought into our district a population many of whose members were not overparticular in keeping their premises clean and sanitary. Although every teacher of the school laid stress on cleanliness and hygiene, it was soon found that something more than daily admonitions was necessary to bring the much desired change. It occurred to me to make the issue a broad civic project to be solved by our clubs. I, therefore, brought the matter before the members at our next civic meeting and urged that they devise some scheme by which to better the existing conditions of the Lawndale district.

The discussion, arguments, and plans were truly interesting. After an outline plan of work was agreed upon, committees were appointed to make a survey of the neighborhood. Lists were made of lots filled with rubbish, of houses having no lawns or trees, of homes having papers and rubbish accumulated about the premises, of unswept streets and littered alleys, and of careless grocers and butchers whose premises could be improved.

At the next meeting the problem of apportioning the work to the various committees faced our little president. As everyone was earnest and ready to put his shoulder to the wheel, this was not so difficult. Someone suggested taking pictures of the uncleaned lots with all their rubbish, then of the lots in the process of cleaning, and again after they were cleaned. This work, of course, took much time outside of school hours, but with the assistance of other civic clubs of the school, it was done systematically and thoroughly. After this hard work was accomplished someone suggested that people living in homes adjoining these vacant lots ought to be instructed not to litter up the premises again. This admonition was duly given.

The attention of the pupils was now turned to lawns. In the manual-training room boys made "Keep off the Grass" signs, which they freely distributed wherever needed. Those landowners who had no lawns were solicited to help us in our project. It was gratifying to have so many co-operate with us.

The back yards were attacked with the same vigor. The improvement of these, however, was very much harder. By writing to the United States Agricultural Department we secured large sacks of vegetable and flower seeds gratis. Committees of pupils set about distributing these. As an inducement for intensive gardening two prizes were offered—one for the best vegetable garden and one for an artistic flower garden. The change that was wrought through this was truly wonderful.

In order to reach all the pupils of the school the various problems that were worked upon by the civic club were presented for co-operation at the weekly assembly meetings. This offered opportunities to write and deliver speeches. No one who had not made his points clear and emphatic was chosen as lecturer for the assembly. This created great competition in address writing.

It is remarkable how one thing suggested another. Someone came with the plan of visiting the neighboring schools and asking for their co-operation. This was done and proved very helpful.

About this time a pupil suggested dramatizing the subject. With persistent effort a play was produced called "The Reforming of a Bad Boy." Appropriate verses were composed by members

of the group and set to the tunes of popular airs. This gave added charm to the play and pleased the class immensely.

At this time the pupils received many complaints from property owners that the garbage collectors were not doing their duty and that the alleys were not in a clean and sanitary condition. To remedy this condition committees were appointed to interview Mr. McGrath, the head of the department. He promised to help us, if we would instruct the people, wherever necessary, to keep their ashes, papers, and rubbish separate. He also agreed to sign warning notices which the pupils might give to those who lacked the proper receptacles.

It was evident now that a mass meeting of the residents of the Lawndale district was necessary. It was decided to invite the two aldermen of the ward, the park commissioner, and Mr. McGrath to address the audience. Accordingly a committee on arrangements went to see these officials, explained the purpose of the meeting, and solicited their aid. The interviews resulted in the promise of a hearty co-operation by all, assuring us of the ultimate success of the mass meeting.

Although a plan of this mass meeting was divulged to all of the pupils of the school during their weekly assembly, yet it was deemed advisable to have bills printed, advertising the time and purpose of the meeting. Accordingly hand bills were planned and printed by the pupils, and posters were made in the art room to advertise the event.

I suggested that since we were to have so many distinguished visitors, we ought to make the evening especially interesting. At once someone said, "Let's give the clean-up play." Another said, "Let's have the president make a speech of welcome." Still another thought that some music ought to be added to the evening's program. All this, properly arranged and executed, made a most interesting program which was heartily appreciated by a very large audience.

However, it was the result of this meeting that interested us the most. Soon after reports of cleaner alleys and yards began to come in. Many people, too, who had hitherto objected to having

the alleys paved withdrew their objection so that now thoroughly sanitary alleys are in the process of construction.

We felt that the results of our project were most gratifying, and that although it took almost five months and much hard labor, it was worth the effort. I have tried to correlate the project problems with almost all the subjects of the course of study and am sure that the pupils gained much in English, oral as well as written composition, civics, hygiene, spelling, manual training, art, and printing. Moreover, the moral influence was inestimable. It is my contention that since the ultimate aim of education is to prepare the child for democracy, the pupil should be given every opportunity to practice democracy in the civic life of the school. There is no reason why the project method could not be used to solve the numberless problems that confront the principal. When educators fully realize the importance of giving the pupils every opportunity of learning citizenship by practicing it in social situations of the school they will have solved the fundamental principles in democratic control of the future citizens of our country.

AN ATTEMPT TO MEASURE THE COMPARATIVE IMPORTANCE OF GENERAL INTELLIGENCE AND CERTAIN CHARACTER TRAITS IN CONTRIBUTING TO SUCCESS IN SCHOOL

S. L. PRESSEY
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I. THE INADEQUACY OF TESTS OF GENERAL INTELLIGENCE AS A MEANS OF PROGNOSTICATING SUCCESS IN SCHOOL

As a result of the present extraordinary activity in the field of "mental tests" we are gradually coming to some general notion as to the relation of the scores on the tests to other criteria of ability, such as school marks. In general, the correlation between marks and test scores is comparatively low, around .55 or so. Such correlations are, as inspection of the correlation plots will at once show, of comparatively little value for diagnostic and prognostic purposes. They suggest that other factors than intelligence are also important elements in determining a child's success in school. Among such elements conscientiousness, deportment, interest, and application are usually mentioned as most important. It is a common practice among those working with tests of intelligence to brush these factors aside as essentially irrelevant. The writer is rather inclined to doubt whether they *are* irrelevant; habits of regularity and application, and temperamental adaptability to the job and to fellow-workers, are of fundamental importance in business, and he can see no reason why such elements of personality should not be trained for, and taken account of, in school. But whether this contention be valid or not, it is obvious that if tests are being used for *prognostic* purposes (that is, if they are being used as a means of foretelling success or failure in school or in later life) then in so far some means should be found by which such character traits also may be measured and taken account of in the total estimate of the individual. The present study is an

effort (*a*) to determine the relative importance of these factors in contributing to success in junior high school and (*b*) to measure the extent to which these same factors contribute to the score on a scale of intelligence.

II. MATERIALS AND METHOD OF THE STUDY

The study deals with results from the seventh-grade class in a large junior high school: a total of 116 cases is involved. Data of three types were collected: (1) the class was examined with a group scale of intelligence recently developed at Indiana University;[1] (2) estimates were obtained on a rating scale, patterned after the officers' rating scale recently used in the army, with regard to the standing of each pupil in (*a*) general health, (*b*) "school attitude" (industry, co-operation, and application), (*c*) preparation, and (*d*) general ability,[2] each child being rated by the teachers in the four "promotion subjects" (English, history, geography, and arithmetic); (3) the marks given these children in the four promotion subjects were averaged to give a statement of school success during the year. The tests were given in March, the ratings obtained in May, and the marks, of course, given in the middle of June. The study undertakes to measure the comparative importance of each one of the four factors rated, in determining (*a*) the school marks and (*b*) the test score.

It is obvious that when dealing with such a complex situation special methods of analysis are necessary. A method splendidly adapted to such a problem is the method of partial correlation. The problem, of course, is to determine the *independent* contribution of each one of the four factors mentioned above to the test score and to school marks. We wish to know the *distinctive* influence of each factor upon marks, the influence which is different

[1] See S. L. Pressey, "School Surveys by Means of Group Tests of Intelligence," *Bulletin of the Extension Division*, Indiana University, Vol. V, No. 1; or a "Brief Scale of Intelligence for Use in School Surveys," *Journal of Educational Psychology*, February, 1920.

[2] General ability was defined as "intelligence, ease in learning, mental grasp"; preparation was the "adequacy of the pupil's schooling to date, and extent to which he has profited by it." By school attitude was meant "co-operation, interest, deportment"; by general health, "vigor, energy, strength, capacity to stand school work without mental or physical strain."

from the influence of any other factor. There may be, for instance, a high correlation between general health and school marks. But this may be due to the fact that those children who have the best health have been able to attend school more regularly and so have a better preparation. The matter might be analyzed if we could only take out of the total group a smaller group who were all alike in previous preparation; we could then correlate general health and the average grade received in school, working only with this group. Such a process would be possible only with an exceedingly large number of cases. The same result can be achieved, however, by the method of partial correlation, which permits us to allow for such complex interrelations between a group of traits, and to calculate the separate contribution made by each to the final results we are studying. The present paper is, in fact, essentially a study in partial correlations.

III. RESULTS

1. *The outstanding importance of "school attitude" as a determiner of school marks.*—The correlation of each one of the four factors mentioned above—health, school attitude, preparation, and ability—with school marks and with each other trait is given in Table I.

TABLE I

	Marks	Health	School Attitude	Preparation
Health	.53	.....	.....	.....
School attitude	.69	.55	.....	.....
Preparation	.80	.65	.71	.....
Ability	.81	.66	.55	.88

As will be seen, there is a distinct postive correlation between each one of these four traits, as estimated by the teacher, and the marks obtained at the end of the year; the lowest correlation, .53 between marks and health, is still a distinct correlation.[1] But it will be

[1] It must be remembered that the ratings were made by the same teachers who shortly after gave these marks. As a result, the correlation between the various ratings and marks is abnormally high. But only by having these same teachers rate the children could the information desired be obtained; if other teachers than those giving the marks had made the ratings, there would be opportunity to suppose, for

seen that the interrelation between the traits is also high. There is evidently much to suggest—to return to the previous illustration—that the correlation between health and marks may very well be due simply to the effect of health on preparation, and not to any direct effect of health at all. But only the partial correlation coefficients can speak definitely with regard to the matter.

These are decidedly interesting. The partial correlation of health with marks—school attitude, preparation, and ability being constant—is $-.19$. That is, when the influence of general health upon a child's school attitude, preparation, and ability are completely allowed for, there appears a tendency for the children estimated as less vigorous and healthy to make better marks than the very healthy ones.[1] The "third-order" correlation of marks and previous preparation (that is, the correlation of preparation and marks, the other three factors being constant) is only .06.[2] The "third-order" correlation of marks and ability is .49. And—the important finding—the similar correlation of marks and "school attitude" is .43. That is, a factor hardly less important than the child's intellectual ability, in contributing to success in school, seems to be the group of character traits included under "school attitude."

Evidently, then, if we wish to foretell success in school, we must obtain a measure of "school attitude." We may expect this factor

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instance, that school attitude had been different under the teachers who gave the marks. The problem demanded rather an estimate of the standing of the various children in the different traits mentioned, as these traits had functioned *in the observation of the teachers giving the marks*, to produce the marks studied.

[1] It must be emphasized that this is not equivalent to saying that the less healthy children do better in school. The statement is only that the relation of health to ability, previous preparation, and school attitute being allowed for, or ability, school attitude, and preparation being constant, there is this negative relationship. The negative correlation is probably due partly to inadequate analysis on the part of the teachers making the ratings; this factor will be returned to shortly. But there is certainly the suggestion here that the special, bookish, and artificial nature of much of our present grade-school curriculum does not make up the sort of work which appeals to the most vigorous and active sort of child, or the sort of work in which the most healthy type of child does best.

[2] This low correlation would suggest that tests of achievement could not give satisfactory data for prognostic purposes, and so has an interesting bearing upon recent work, in which such tests have been so used. But certain factors qualifying such a conclusion have still to be discussed.

to play quite as distinctive a part in the school history of a child as does his ability, and a more important part than his previous scholastic acquirement to date.

2. *The primary importance of preparation and ability in determining results on a scale of intelligence.*—A very different situation appears when a similar study is made of the proportional importance of the four factors already mentioned in contributing to success on a scale of intelligence. The correlations are shown in Table II.

TABLE II

	Scale Rating	Health	School Attitude	Preparation
Health	.41	.....	.....	.....
School attitude	.47	.55	.....	.....
Preparation	.65	.65	.71	.....
Ability	.63	.66	.55	.88

Here we see that the correlation of preparation with score is slightly higher than the correlation of the score with ability. But all the correlations are positive and appreciable, and again it remains for partial correlations to analyze the situation. The correlation of health and test score, the other three factors being constant, is again a minus quantity, but a small one, $-.07$. The similar correlation of test score and ability is .17. The correlation of school attitude and test score is .06. And the correlation of preparation and score is .19. In fact, the complexion of the situation is entirely changed. And the striking feature of the change is this, that school attitude, so distinctively important to school success, finds no expression in the test results.

IV. THE NEED FOR A MEASURE OF SCHOOL ATTITUDE

It should be mentioned at once that the situation is by no means so simple, nor the interrelation of the facts so clear, as this abbreviated statement of the situation would imply. Particularly is it important, in all such elaborate treatment of data, to remember that no mathematical method, however refined, can transcend the reliability and significance of the original materials. In certain respects the writer's conclusions are subject to all the errors involved in any series of estimates by teachers. However, the results used

are the averages of the estimates of four teachers regarding each case. And the estimates were made with scrupulous care,[1] using a carefully systematized method of known worth. The writer believes the ratings to be, all things considered, of unusual trustworthiness.[2] If, then, there may be inferred at least a rough reliability in the figures obtained, we have a very definite and concrete argument to show the inadequacy of measures of intellectual ability alone as a basis for educational readjustment and the necessity of some means of measuring character traits, if prognosis is to be at all adequate. Can such means be found?

There are, of course, no tests for the measurement of character.[3] However, the same method of systematized estimates previously described can be of definite service for this purpose. A rating scale designed on the basis of the data just presented is given on page 226. It is at present being used by the writer as a method of obtaining information for purposes of educational guidance.

[1] The writer's debt to Miss Mary Kerr, principal of the Bloomington Junior High School, and to her teachers can hardly be overemphasized. The factors to be covered in rating were chosen largely on the basis of suggestions by Miss Kerr. And the ratings were worked out with a conscientiousness and thoroughness which made them exceedingly valuable. In fact, credit for whatever merit there may be to the study belongs rather more to Miss Kerr and her teachers than to the writer.

[2] The important constant error is, of course, the inevitable tendency of even the best judges to generalization and incomplete analysis, and along with this the natural tendency of teachers to overemphasize the relation between school achievement and ability. As a result, it may be supposed that, in general, the final partial correlations underestimate the importance of both preparation and school attitude; such constant errors in the original estimates would lower distinctly the "third-order" correlation of these two variables with marks and might also account for the negative correlation with health. But about the one point which is the thesis of this paper, the large independent importance of certain character traits as fundamental factors for success in school, there would seem no question—the real importance of "school attitude" is probably, because of the influence of these inaccuracies in the measures, considerably underestimated.

[3] The writer has a private faith that sometime tests will be developed which will measure such factors. If investigators would only get away from the confining notion that a test is a trial exercise of ability and see that a test is simply a special, carefully systematized and standardized method for obtaining data about any topic, then it would be clear that data regarding such elements of character might quite as well be gathered by the test method as by data of any other sort. For further discussion of the matter see S. L. and L. W. Pressey, "Cross Out Tests, with Suggestions as to a Group Scale of the Emotions," *Journal of Applied Psychology*, June, 1919.

PUPIL RATING CARD

The scale below is designed for the rating of pupils, as regards capacity for school work as conditioned by three factors, (1) general ability, (2) school attitude, and (3) previous preparation.

First, under the heading "general ability" below, write on the first line (45 value) the name of that pupil, of all you have ever known in the grade you are rating, whom you consider most intelligent, most capable. Then write on the last line in this section (9 value) the name of the dullest pupil you have ever known in that grade. Then choose a middle case for the middle line. Finally fill in cases halfway between the middle and each extreme.

Next make up a similar scale for "school attitude" (co-operation, interest, deportment).

Finally, make up another set of five cases as reference points in judging previous preparation (that is, adequacy of the pupil's schooling to date and the extent to which he has profited by it).

Now rate your class as to standing in these three groups, using the foregoing scales and reference cases. (It is urged in rating that the intermediate points, as well as the five reference values given on the scale, shall be used.)

Scale

1. General ability (intelligence; ease in learning; capacity for reasoning; mental grasp).

.....45
.....36
.....27
.....18
..... 9

In this scale school attitude and general ability are rated on a scale of 45, and previous preparation on a scale of 15, thus roughly weighting these factors in proportion to their importance as indicated by the partial correlations. The writer has found that ratings obtained on such a scale, from teachers well acquainted with the children they are considering, constitute data of great value in analyzing a child's school career to date and estimating his probable future success.

One further element in the situation must, however, be considered. In going over cases rated sometime previously by this method, the principal of the school several times remarked that this or that child's "attitude" had markedly changed since the

ratings were made. It was also found that different teachers' estimates as to "school attitude" were strikingly different.[1] That is, as we have long been taught, a person's relative standing in intelligence is a matter largely fixed and unchanging. But his character traits and attitudes may change from one year to another and may be different under the influence of this or that person. To a considerable extent school attitude is undoubtedly the result either of innate, hereditary temperament, or fundamental habits of work, attention, obedience, hardly less deep seated and unchangeable over such relatively brief periods as are taken account of for purposes of educational diagnosis and prognosis. In so far as school attitude is thus the result of relatively constant factors, the measurement of these factors may be used for prognostic purposes. But to a very considerable extent school attitude appears to be especially the factor in the total situation which is the product of the environment. A school can, after all, do very little in the way of developing a child's intellectual abilities. Those abilities are born in him, and their flowering is a process over which the school has relatively little control. But the child's attitude toward his school work, his attitude toward things in general, perhaps—*this* is a matter where the policy of the school and the personality of the teacher may most of all count. As Thorndike says:

> The one thing that educational theorists of today seem to place as the foremost duty of the school—the development of powers and capacities—is the one thing that the schools, or any other educational forces, can do least. . . . . Moral traits are more often matters of the directions of capacities and the creation of desires and aversions. Over them education has greater sway, though school education, because of the peculiar narrowness of the life of the schoolroom, has so far done little for any save the semi-intellectual virtues.[2]

The result is a number of more or less tentative conclusions. It would be much more satisfying to come out, after the more usual fashion, with the easily remembered notion that the one important factor in the whole business is "general intelligence," and that with the Binet scale, or a similar test, a completely satisfactory

[1] That is, the coefficient of reliability for estimates of general ability was found to be .72, the reliability for estimates of preparation was .62, but the reliability coefficient for school attitude was only .40.

[2] *Educational Psychology*, III.

diagnosis may be made.[1] But the situation is surely not so simple as that. Perhaps the gist of the present study may be summarized as follows: (1) If the elements contributing to a child's success in school are to be adequately understood, not only that child's ability or intelligence but his attitude toward his school work—his industry, his interest, and his deportment—must also be taken into account. These factors appear to be almost as important as a child's purely intellectual capacities in conditioning his success in school. (2) For purposes of educational diagnosis and guidance it is, therefore, of great importance that these character traits be taken account of and that some sort of measurement of these elements be obtained. In the present undeveloped state of work along this line it would seem that such information might be most readily obtained by means of systematic estimates or ratings. (3) However, these character traits are particularly the elements in the total situation which may be most readily developed and trained by the school. In so far, these traits are not constant factors which may be used as a basis for prognosis, but are the unpredictable elements in the prognostic situation, and the elements with reference to which, to a peculiar degree, the school is responsible.

SUMMARY

1. The paper deals with the comparative importance of general health, "school attitude," preparation, and ability, in conditioning

[1] The writer does not, of course, wish to imply that scales for measuring general intelligence are not of great and fundamental importance for any such educational diagnosis. He only wishes to emphasize the fact that there are other, emotional and volitional, elements in the situation also—a fact which the most careful investigators with tests of intelligence are always among the first to grant, but which is sometimes forgotten by those in the first enthusiasm of such work. The partial correlations of the present study should not, perhaps, be taken too seriously. But they may surely be considered suggestive.

It should be noted in this connection that a correlation of .70 or so between school achievement and intelligence need not by any means warrant the conclusion that the remaining factors have a correlation of no more than .30 with school work, or that the importance of intelligence and the other factors is in that proportion. It is still entirely possible, under such circumstances, that there may be another factor besides intelligence of about equal importance in conditioning school success. The point has been well discussed in a recent paper: Curt Rosanoff, "Is Lack of Intelligence the Chief Cause of Delinquency?" *Psychological Review*, XXVII (1920), 147-57.

success in school and success on a scale of intelligence. The method of partial correlations is used throughout.

2. The data give a minus third-order correlation between general health and school marks, and a relatively low correlation between preparation and marks; the high correlation of "school attitude" with marks is the striking feature of the situation.

3. The scale of intelligence is found to measure about equally preparation and ability; the correlation with school attitude is negligible.

4. The tests thus fall short in failing to take account of "school attitude"—that is, of character traits as conditions of school success. A rough method for obtaining ratings regarding "school attitude" is suggested.

5. Some evidence is, however, presented to show that school attitude is the environmental and unpredictable factor in the total situation. That is, while a child's ability is hereditary and fixed, his attitude appears to be quite largely the result of outside influences, particularly in the school.

Educational Writings

REVIEWS AND BOOK NOTES

Improving the curriculum.—The attitude of the majority of progressive school people has now reached the stage where it is possible to discuss the curriculum from a social point of view and to expect ready co-operation in any sensible program for its improvement. Any acceptable plan for revision, however, must be of such a nature that it is administratively possible to introduce it without an abrupt upheaval which would destroy the educational sequences of the present school generation. Professor Bonser has presented a book[1] which will be a very practical help in a thoroughgoing and constructive revision of the curriculum.

The author takes the point of view that "it is possible to organize a curriculum wholly upon the basis of *activities of life* in which children actually engage rather than in terms of *subjects* in which, as such, few are engaged. It is believed that this is ideally desirable. But the break between the present practice and organization around projects would be so great that such an attempt, if made with any degree of haste, would not fully succeed in most public schools" (p. vi). The aim of the book, therefore, is to emphasize an intermediate step in the nature of a gradual transition from the present method of organization toward the form ideally desirable.

The first division of the book, consisting of eight chapters, is a discussion of the basic principles of curriculum revision. In making a curriculum, the standard proposed for measuring its educational value is the degree in which it makes a difference in conduct. Conduct is analyzed into experiences which relate to health, to practical efficiency, to citizenship, and to the use of leisure. For the elementary school the curriculum should include experiences desirable for all children without reference to sex, future education, or social condition. Drill in formal subjects should not be carried so far that interest in the mechanical elements exceeds the interest in their use. It is recommended that in form the curriculum be organized in three divisions, as follows:

a) Suggestive projects which reflect the activities and interests of the life in which the children themselves are participating.

b) The subject available from the results of race experience required for the carrying forward of these projects in the best way.

[1] FREDERICK G. BONSER, *The Elementary School Curriculum.* New York: Macmillan Co., 1920. Pp. xvi+466.

c) A briefly summarized organization of essential methods and skills, and of ideals, attitudes, and appreciations to be developed in connection with the projects and subject-matter. This organization is to serve as a standard of reference for the teacher.

The essential elements constituting the third part of the curriculum should be practically the same for all elementary schools. The subject-matter representing the second part should be much the same, although in some details and in sequence there may be much difference. The projects may differ very much in response to the environing differences of schools [pp. 151–52].

In the second division of the book the discussion is divided into chapters dealing with the various elementary-school subjects. The form of each of these chapters is similar, including, first, a discussion of the purpose and content of the subject, second, a large number of selected projects for each of the six elementary grades, and third, a brief statement of the principles for selection and organization of material in the subject. These chapters are particularly rich in suggestions for usable projects.

The third division of the book, consisting of the last chapter, is unique in that it takes an objective view of all the preceding chapters and attempts to give the reader a set of directions for using the book in improving the curriculum. This chapter elaborates somewhat one of the general principles given in the earlier part of the book which proposed that

> the curriculum for a given school or school system should be the joint product of all the school staff. Teachers should participate in any revision of a curriculum to such a degree that they feel a large share of authorship in its changes and of responsibility for carrying out the changes. Superintendents, principals, and supervisors should be responsible for leadership in stimulation, plans of organization for revision, and helpful constructive advice [pp. 153–54].

As a whole, the book is a careful piece of work and is worthy of wide reading. It should be of value both for college and normal-school classes in education, and for study and discussion by groups of teachers and principals who are attempting to modify constructively the curriculum in their own schools.

Consolidation and the rural-school problem.—One of the thoughts rising in the minds of the American people today is the value of co-operation. The editor of a new book on school consolidation[1] views this movement in rural education as a part of the broad integration and socialization of all the nation's forces. In 1917 thirty states reported a total number of 5,132 consolidated schools, while a conservative estimate places the total for the United States in the same year at 7,500. Practically all of the literature that has appeared describing this new educational advance is in the form of circulars, reports, magazine articles, and isolated chapters in books. It is to meet this need of

[1] LOUIS W. RAPEER, *The Consolidated Rural School*. New York: Charles Scribner's Sons, 1920. Pp. xiii+545.

a thoroughgoing book based on a nation-wide acquaintance with, and investigation of, this type of school that this volume has been prepared by the editor in co-operation with other specialists.

The purpose of the book, as stated in the Preface, "is based on rather definite aims of education and on a social theory of the function of the rural school." The subordinate aims are placed in a fivefold program of vital efficiency, vocational efficiency, avocational efficiency, civic efficiency, and moral efficiency. This program is the goal of each chapter.

The Table of Contents is suggestive of the approach to the subject. Chapters i and ii develop the historical, social, and economic background of consolidation. Here we find such topics as national and rural consolidation, the American rural school, community organization, and rural economics. Chapters v and vi deal with school administration and the growth of consolidation. The next chapter describes a successful consolidated school in Colorado. Chapters viii to xi inclusive discuss the school site and building, the teacherage, and transportation of pupils. Chapter xii is written by six experts and takes up the method and facts of consolidation. The next four chapters, xiii–xvi, discuss the curriculum, rural-life needs, college-entrance demands, and relative values in English instruction. Chapters xvii and xviii touch briefly on the learning and teaching processes. The remaining four chapters deal with the country girl, rural recreation, the difficulties of consolidation, and the new consolidated school.

The bibliography at the end of the book is quite exhaustive. Page references are given in many cases, and the books are classified into groups. The book is to be commended on its attempt to use the problem approach to the various topics. Each chapter opens with a list of preliminary problems and closes with a list for application. The volume covers a wide range of material in its 545 pages, dealing with no topic exhaustively but giving a comprehensive view of the situation. Most of the material is based on reports, investigations, and observations of the actual condition of the consolidated schools throughout the country. The book will find a place among students and teachers of rural education.

Problems of vocational education.—There are evidences that the modern movement for vocational education is rapidly passing from the exploratory stage of grasping and varied speculation and is settling down to a systematic analysis of certain clear-cut problems defined by experience, and to a series of direct attacks upon such of these as seem possible of immediate solution. Thus, out of the numberless theories, experiments, and compromises of the movement thus far, there have emerged a few coherent conceptions of the meaning, purposes, methods, and management of vocational training which, being definitely and positively built upon existing knowledge and conditions as these are interpreted, are problems challenging the immediate interest

of those upon whom rests the responsibility for the continued progress of the movement. Perhaps the most significant evidence that the trend of effort lies along the line of attack upon the few more salient problems is the fact that the literature of the field is becoming less vague and scattering as well as less idealistic.

Professor Snedden's recent volume[1] is devoted to a consideration of a number of the more pressing problems of vocational education and gives special emphasis to those concerning which there is at present the most pronounced disagreement. The author presents a candid statement of the basis of the controversy in every case and makes clear and certain his own view. He defines explicitly all the technical terms used to designate the different types and phases of vocational training, explains the economic and sociological background of the movement, and ventures a specific prophecy as to the probable scope and character of such training in the United States twenty-five years from now.

Designating the major divisions of "education" as vocational, physical, social, and cultural, the writer defines vocational education as any form of education, "whether given in a school or elsewhere, the purpose of which is to fit an individual to pursue effectively a recognized profitable employment, whether pursued for wages or otherwise," and draws the following distinction between general education and vocational:

> General education aims to develop general intelligence, powers of appreciation in all common fields of utilization, and powers of execution with such intellectual instruments as language, mathematics, scientific method, etc., without reference to recognized or specific callings; while vocational education has its aims, and, therefore, its means and methods, determined in any case by the requirements of a specific calling [p. 538].

The certain implications of this difference in function and of the requirements set for vocational training, then, are several: (1) Each individual should be guaranteed opportunities for at least a minimum general education before vocational training is begun. (2) Vocational education and comprehensive general education cannot effectively be provided in a "blended" program. (3) General vocational education is impracticable. (4) Effective administration of vocational training involves the establishment of a great many types of specialized trade schools located in appropriate rural or urban communities. (5) Short unit courses, both general and vocational, adapted to the needs, deficiencies, or interests of the individual must be provided in continuation schools.

The writer takes the most extreme position with reference to specialization in vocational training. Pointing to apparent defects in current schemes of commercial education, for example, he argues that such can be made really

[1] DAVID SNEDDEN, *Vocational Education*. New York: Macmillan Co., 1920. Pp. xi+587.

vocational only as they are based upon the results of careful analysis of the numerous commercial vocations for which training is practicable. Such analysis, he concludes, far from leading to a comprehension of "common elements" in the occupational needs of a group of workers, as "clerks in stores," making possible the organization for them of a worthwhile sort of training, points with certainty to a differentiation of the type here described:

> Ten minutes' walk down the business street of any city will enable us to see working clerks in: soda water fountains; shoe stores; grocery stores; lumber and coal yards; department-store glove counters; hardware stores and stores for men's clothing. What are their common forms of vocational knowledge, skill, or ideal? Would not all attempts to give general commercial training to youths who might embark in these callings principally resolve themselves into solemn talks *about* salesmanship, supplemented by a few bits of specific training in the making of figures, use of cash registers, etc.?
>
> Suppose, however, we had 100 boys of sixteen, all of whom were as desirous and certain of becoming grocers' clerks in small cities as dental students are of becoming practicing dentists; could we not readily devise means to provide at least two years of rich vocational education for them, on a half-time participation basis, probably on a wage of ten to fifteen cents per hour for 30 hours per week?
>
> In other words it seems probable that we shall have to define "store clerk" vocations more specifically than we have heretofore done, as a basis for working programs. One inevitable consequence of this will be the differentiation of schools according to communities. Not every town could expect to have schools respectively for hardware clerks, drug-store clerks (some of whom are, of course, now trained—but not for salesmanship—in schools of pharmacy), shoe-store clerks and green grocer's clerks. But within a group of neighboring towns could readily be provided one of each of these forms of schools [pp. 199–200].

Others of the problems confronting the administrator of vocational education are analyzed in the same thoroughgoing way, and suggestions as specific and detailed are presented. The book will be read with interest by anyone concerned with the problems of this field, whether or not the point of view expressed by the author with reference to any particular one of these problems can be accepted.

Educational conditions in Siberia.—During the year 1918 Dean Russell, of the College of Education of the University of Iowa, was sent to Russia in the service of the Educational Division of the Committee on Public Information. One of the results of his mission has been the preparation of a book[1] discussing the educational situation as it existed there at that time.

The book opens with an explanation of the general conditions in the country and the effect upon education of the recent political upheavals. Following this, six chapters are devoted to an explanation of the various grades of education and their form of organization. The discussion is supplemented

[1] WILLIAM F. RUSSELL, *Schools in Siberia*. Philadelphia: J. B. Lippincott Co., 1919. Pp. 135.

by reports, documents, and tables which throw much light upon the school problems of Siberia.

In the latter part of the book are two chapters entitled "Teachers' and Pupils' Unions" and "Experiences with Siberian Teachers." Permission for the organization of teachers' unions was one of the first privileges allowed by the Kerenski government, and these unions have rapidly attained great importance in the school system. The account of the teachers' meetings, described in the second chapter just mentioned, shows the enthusiasm and earnestness with which the teachers are attacking their problems.

In view of the difficulty of getting accurate information regarding conditions in Russia, the book is of especial value. Its limitations are expressed by the author in the following quotation:

> This study, therefore, is based upon the results of personal observation and conferences. As far as it goes, it is accurate and carefully done. It probably is typical of all of Siberia. There is a possibility that it is not. It is an impression of an era in Russian educational history that is very important, for in the months of September, October, November, and December, 1918, the teachers of Siberia first had opportunity to use their new-found freedom in the administration of schools. The reader must remember, however, the limitations of this study [pp. 10–11].

The high cost of education.—The rapid rise in the cost of living during the last few years has caused many teachers to raise the question of how much salary increase is necessary to offset the change. The present cost of material and labor is causing anxiety over building policies for many superintendents and school boards. A recent monograph[1] from the Russell Sage Foundation gives information concerning each of the foregoing situations and will be welcomed by all school people.

The monograph discusses the increasing cost of education; teachers' salaries, with their relation to the cost of living and to the wages of other workers; the trend of building costs; necessary changes in school budgets; and sources of income for meeting increased school costs. The tables and diagrams give data for each year from 1840 to 1920, and afford a means of drawing comparisons between the Civil War period and the present time. Every school superintendent should have the information which the monograph contains.

Aside from the content, the method employed in the study will be of interest to students of education. Two statistical devices are employed which are worthy of much more extensive use. The first of these is the method of index numbers, which, while not a new statistical device, has not been commonly used in education. A second method of interest is the use of the coefficient of regression for determining the lines of general trend in school costs. While correlation coefficients are familiar to most students, the many possible

[1] W. Randolph Burgess, *Trends of School Costs*. New York: Russell Sage Foundation, 1920. Pp. 142. $1.00.

and desirable uses of the coefficient of regression are not commonly known. The monograph affords an excellent example of the use of these two methods.

Manual and industrial arts.—That the manual arts have advanced to a permanent place in the educational field is undoubtedly true. Their entrance into it, however, has served to open many problems with reference to their instructional aspects, their place in the curriculum, the manner of their organization, and the direction in which their further evolution may with safety be directed.

Professor Griffith, in a recent book,[1] has undertaken to attack one of these problems not commonly dealt with heretofore, namely, the psychological foundations upon which rest the principles of instruction in the subjects involved.

The book is designed for normal-school and college classes. In a large way his considerations are based upon a classification of nerve connections: first, between sensation and muscular reaction (instinctive); second, between sensation and thought (conscious, intellectual); third, between one thought and another (intellectual); and fourth, between thought and bodily reaction (habits, once intellectual but finally controlled by feeling). He notes the one-time dominance of the intellectual ideal alone, and states that "society and the race depend for successful maintenance and progress upon the development of both effective forms of thinking and action." Throughout his arguments he contends for a balance between the conflicting demands of the various aims of education. He admits unreservedly the place of intellectual training in race progress when he states a "third type of reaction is the highest—a type of reaction based upon an analysis of situation and a reasoning of cause and effect." He finds justification for the intelligent establishment of motor responses in their service as a means of expressing ideas; developing attitudes and habits; and developing knowledge of processes, attitudes, and habits of vocational significance. His conclusions are clearly stated and altogether defensible, for he does not go beyond evidence presented by alternative considerations.

In the first two chapters he differentiates the manual and industrial arts and seeks to place each in its relation to the educational needs of society. The seven chapters following are concerned with the development of psychological forms but made pertinent by constant allusions to materials familiar to the pupil specializing in the manual subjects. Chapters xii and xiii are especially noteworthy, presenting in admirably suggestive manner helpful principles on "The Lesson" and "Class Management" respectively. These might be read with profit by any prospective teacher. Here again illustrative materials are drawn from the field familiar to the pupil.

[1] IRA S. GRIFFITH, *Teaching Manual and Industrial Arts.* Peoria, Illinois: Manual Arts Press, 1920. Pp. 229. $2.00.

Chapter xiv deals with "Standards and Tests," thus introducing the pupil to the idea of self-evaluation in terms of a scale, as well as to the possibility of applying certain similar processes to his results as a teacher through evidence found in the skill, habits, and knowledge of his pupils. The final chapter is a résumé of the large ideas presented in those foregoing.

Although one feels the need for a more extended discussion of many of the points, there is left in the mind of the reader the conviction, nevertheless, that Mr. Griffith has sought to present the facts in as simple and untangled a form as possible, with the specific purpose in mind of establishing a workable pedagogy on the psychological principles developed. One feels that he has succeeded in his purpose in an admirable degree. The book ought, therefore, to be of great service to both teachers and pupils in the field of manual arts, as well as to educators in general.

A guide for using the dictionary.—Teachers will always make use of books growing out of actual classroom procedure. Few of the minor topics dealt with in the modern elementary school are neglected more than dictionary study. It is to fill this need that Anna L. Rice has prepared a booklet[1] on teaching the use of the dictionary.

The purpose of the book is clearly expressed by the following statement from the Preface. "These outlines have been prepared for the use of teachers in grades four to seven inclusive, and cover as much of the subject of dictionary study as can profitably be taught to pupils of these grades" (p. 3). The outlines are arranged under the following topics in the order named: the alphabet, vowels, consonants, syllabication, accent, the hyphen, pronunciation, meaning of words, use of dictionary, and rules for spelling. There is a separate outline for each of the four grades, with a statement of the minimum time required. Following the outline are lists of suggestive questions for grade tests as actually given in the schools. Many valuable suggestions to teachers who will use the outlines are given in the Preface. A bibliography for the teacher is found at the end of the book.

The little volume bears evidences throughout of having been subjected to the practical tests of the classroom, and teachers will find it to be a practical and helpful guide.

Visual instruction.—The interest in the use of pictures for teaching is becoming widespread. The value of the method depends very much upon proper discrimination in selecting materials. A set of books[2] for visual instruction, edited by Commissioner Kendall, appeared in 1916 and has been recopyrighted in 1920. This work is worthy of even greater attention than it received during the busy war years.

[1] ANNA L. RICE, *Outlines in Dictionary Study*. New York: Gregg Publishing Co., 1920. Pp. 77. $0.60.

[2] CALVIN N. KENDALL, editor, *Pictured Knowledge*. Chicago: Compton-Johnson Co., 1916, 1920. Vols. I–VI. Pp. xxxv+2354.

Pictured knowledge consists of six volumes which present in a well-organized series topics from practically all of the school subjects. The staff of contributing editors includes many of the best-known school men of America. The text material is written, not in the popular, semi-accurate style characteristic of many books of this kind, but in the careful style of the descriptive material accompanying illustrations in the better class of school textbooks. The collection of pictures, which constitutes the major portion of the volumes, is quite superior. They have been chosen with care and would tell a great deal even without the supporting text.

Such a work as this would serve a good purpose in any schoolroom, especially in those so situated that the life-experiences of the pupils are naturally limited. The wide interest stimulated is perhaps as important a factor as the added fund of information which is contributed.

New civics material.—The introduction of civics teaching in the lower grades is becoming increasingly common. One of the greatest difficulties in doing this is the securing of suitable material which is based upon the children's experiences and which will function in their behavior. Miss Harris has recently prepared an excellent series of civics lessons[1] for use in the three primary grades. These lessons are based upon the experiences of children living in cities and are therefore suitable for only that class of children.

For each of the first three school grades there is given a list of situations of civic significance typical of the life of children in that grade. Each of these situations is then made the subject of an extended topical treatment, organized into four main divisions. The first of these divisions gives an extension of the children's experiences and observations; the second division includes interpretations and enlargements by the teacher; the third outlines methods of teaching the topic, giving illustrations; while the fourth outlines the results toward which the lesson is aimed.

An extension of the series for the next three grades is in process of preparation. These lessons are very suggestive and should be in the hands of all primary teachers. A similar series designed for use in smaller communities would be very serviceable.

The class of supplementary reading material for civics classes has been increased by an interesting little book by Mr. Baldwin,[2] containing historical sketches, selected poems, and other stories. The book is so organized that it traces the development of liberty among English-speaking peoples through its great epochs from the Magna Charta to the Emancipation Proclamation. The various selections used are so woven around the central theme of liberty

[1] HANNAH M. HARRIS, "Lessons in Civics for the Three Primary Grades of City Schools," *Bureau of Education Teachers' Leaflet No. 9, 1920.* Washington: Department of the Interior. Pp. 64.

[2] JAMES BALDWIN, *The Story of Liberty.* New York: American Book Co., 1919. Pp. 240. $0.88.

that it leaves in the minds of the readers a clear and inspiring conception of the ideal of freedom.

Another civics reader of a more elementary nature has been written by Mr. Fraser.[1] This book gives a descriptive account of the workings of our government in a style which will be of interest to elementary-school children. The material follows the traditional type of civics treatment and will be of value only as a supplementary reader giving a rather complete fund of miscellaneous information about our form of government.

Mental testing in elementary schools.—In the spring of 1919 the General Education Board made an appropriation of $25,000 to the National Research Council for the purpose of preparing and standardizing a group intelligence test. A committee of five psychologists was appointed to undertake the task. The results of their work are now available.

These tests,[2] which are for use in grades three to eight have been adapted from the army intelligence examinations. Two scales, A and B, have been prepared, and additional forms of each will be issued at six-month intervals. Each scale contains five sets of tests and requires approximately thirty minutes' time. Convenient scoring stencils are provided. Tentative norms for comparison are given in the manual of directions.

The National Research Council plans to use the royalty from the sale of the tests to extend their value and to provide a co-operative information service for the users of the tests. It is to be expected that the *National Intelligence Tests* will soon become the best standardized of any in the field.

Health education.—Those concerned with health work in the schools will find much of interest in the report[3] of the last international conference of women physicians. Three of the six volumes are more particularly related to educational problems. The first volume, entitled "General Health Problems," includes articles on exercise in schools, health classes for children, dental work, etc. Volume II, entitled "The Health of the Child," contains discussions of child hygiene, open-air schools, child labor, play, the sexual life of the child, the neurotic child, and other health subjects. Volume V contains a number of good papers on sex education and adaptation to life. This volume would also be of interest to students of educational psychology.

[1] C. C. FRASER, *The Young Citizen's Own Book.* New York: Thomas Y. Crowell Co., 1920. Pp. 320.

[2] R. M. YERKES, M. E. HAGGERTY, L. M. TERMAN, E. L. THORNDIKE, and G. M. WHIPPLE, *National Intelligence Tests.* Yonkers-on-Hudson, New York: World Book Co., 1920. Scale A: Form 1; Scale B: Form 1. $1.60 per package of 25 tests.

[3] *Proceedings of the International Conference of Women Physicians.* New York: The Womans Press, 1920. Vols. I–VI. Pp. 1150. $3.00.

At a time when health education is being greatly emphasized, these reports are especially helpful. The international character of the list of speakers affords an interesting view of the health problems in other parts of the world.

CURRENT PUBLICATIONS RECEIVED

GENERAL EDUCATIONAL METHOD, HISTORY, THEORY, AND PRACTICE

Americanization in Delaware. Newark, Delaware: Service Citizens of Delaware, 1920. Pp. 87.

Arithmetic Survey in the Public Schools of Newark, New Jersey. Newark: Board of Education, 1920. Pp. 30.

DRUMMOND, MARGARET. *Five Years Old or Thereabouts.* New York: Longmans, Green & Co., 1920. Pp. ix+180. $1.80.

FARNSWORTH, C. H. *How to Study Music.* New York: Macmillan Co., 1920. Pp. xiii+294.

HASLUCK, EUGENE LEWIS. *The Teaching of History.* Cambridge, England: Cambridge University Press, 1920. Pp. 121.

THOMPSON, FRANK V. *Schooling the Immigrant.* New York: Harper & Brothers, 1920. Pp. 408. $2.00.

BOOKS PRIMARILY FOR ELEMENTARY-SCHOOL TEACHERS AND PUPILS

ATWOOD, WALLACE W., ALLEN, NELLIE B., and ROBINSON, EDWARD K. *Practical Map Exercises in Geography and History.* Boston: Ginn & Co., 1920. Pp. 32. $0.56.

FRASER, CHELSEA CURTIS. *The Young Citizen's Own Book.* New York: Thomas Y. Crowell Co., 1920. Pp. 320.

PUBLICATIONS OF THE UNITED STATES BUREAU OF EDUCATION AND SIMILAR MATERIAL IN PAMPHLET FORM

Recent issues of the Bureau of Education:

Bulletin No. 47, 1919.—*Private Commercial and Business Schools,* 1917–18.

Bulletin No. 73, 1919—*Nurse Training Schools,* 1917–18.

Bulletin No. 84, 1919—*The University Extension Movement.*

Bulletin No. 8, 1920—*Agricultural and Mechanical Colleges.*

Twentieth Annual Report of the Director of Education. Manila, Philippine Islands: Bureau of Printing, 1920. Pp. 167.

MISCELLANEOUS PUBLICATIONS

Annual Report of the Smithsonian Institution, 1918. Washington: Government Printing Office, 1920. Pp. xii+612.

DRINKWATER, JOHN. *Abraham Lincoln. A Play.* Boston: Houghton Mifflin Co., 1919. Pp. xiv+112. $0.85.

DUCLAUX, EMILE. *Pasteur: The History of a Mind.* Translated by Erwin F. Smith and Florence Hedges. Philadelphia: W. B. Saunders Co., 1920. Pp. xxxii+363.